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ORIGINAL ARTICLES

THE LOCAL EFFECTS OF GALL-BLADDER INFECTIONS AND GALLSTONES UPON THE DIGESTIVE TRACT AND LIVER.*

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Infection of the gall bladder may be either acute or chronic and may be associated with the presence of gallstones. Acute infection of the gall bladder may be due to the colon or typhoid bacillus or to the pneumococcus, streptococcus or staphylococcus. Acute cholecystitis may be associated with suppuration and resulting empyema of gall bladder or with gangrene. Acute cholecystitis without gallstones is a painful affection. The pain is usually referred to the gall bladder region and epigastrium, and sometimes with pain in the right scapular region. There is marked rigidity of abdominal muscles and acute tenderness of the abdomen, more marked in the region of the gall bladder. Nausea, vomiting and great prostration is usually present. With the establishment of gangrene, as with gangrene of the appendix vermiformis, there may be a diminution of the local pain, tenderness and a lessening of the general symptoms. As in gangrenous appendicitis the condition is a dangerous one and doubly so because of the apparent cessation of the disease. Cholelithiasis with acute cholecystitis does not differ materially from cholecystitis without gallstones with the exception that there may be a more marked pain from biliary colic and perforation may occur more readily because of the presence of stone or stones.

Acute cholecystitis with suppuration or gangrene may rupture and general septic peritonitis occur; or in the event of formation of adhesions result in a circumscribed abscess which may exist for a considerable period of time. In one patient seen by the writer, the abscess filled the

* Read before the Chicago Medical Society, April 20, 1910, in a symposium on Gall-Bladder, Gall-Ducts and Liver.

upper right quadrant of the abdomen, thoroughly walled off from the general peritoneal cavity and contained not less than one quart of pus. Such an abscess may rupture through the abdominal wall or may burrow in various directions opening in the lumbar region of the back or downward along the posterior abdominal cavity to the psoas muscle to a point in Scarpa's triangle or passing upward under the liver to the diaphragm rupture into the pleural cavity or through the lung and finally may rupture into the stomach or the intestinal tract. Such an abscess may be followed by abscess of the liver. With the formation of adhesions between the gall bladder and stomach or duodenum or colon, the gall bladder may rupture directly into the gastrointestinal tract into which it may discharge its contents. Spontaneous cure of cholelithiasis may result in this way.

Chronic cholecystitis with or without gallstones is usually associated with repeated attacks of increased infection manifested by more or less pain in the gall bladder region referred to the epigastrium and often to the right scapular region. Gallstones are usually present. Attacks of infection with colic may last for a variable time, from a few hours to several days. The pain may be very severe or may be mild. There is usually associated with it nausea, vomiting and more or less general disturbance, including sometimes a considerable fever. Jaundice is not present unless the cystic duct has become dilated from the presence of stone and in consequence may press upon the hepatic duct, causing obstruction and jaundice. Some patients may suffer from almost continuous pain or a sense of dull aching in the right upper belly but usually there may be one or more attacks of biliary colic. Chronic cholecystitis is usually associated with a thickening of the gall bladder wall and contraction of that organ. In a few instances with obstruction of the cystic duct due to the continued infection or to impacted gallstones, the gall bladder may become distended with a mucus-like fluid and present itself as a pyriform tumor.

With the passage of stone into the common duct, the biliary colic becomes more severe than that due to the presence of stone in the gall bladder and cystic duct. This increased pain is probably due to the greater tension and stretching in the gall bladder and ducts above the obstruction. Vomiting, chill, fever and profuse sweating with great depression of the circulatory apparatus is usually present. The severity of pain and marked depression may result in death. The gallstone may lodge in the ampulla of Vater and produce the well known condition described by Fenger as "ball valve stone." This consists of a condition of almost continuous jaundice but with periods of an increase in the amount of bile thrown into the general circulation associated usually with chill, fever and sweating lasting for a day or a few days to be followed by a partial or complete cessation of all of the symptoms for a variable period. There may be pain with the paroxysm with chill, fever, sweating and increased jaundice, or pain may be absent. With the passage of a stone into the intestine there may be entire relief of all of the symptoms and if it be a single stone spontaneous and permanent cure may result.

A large gallstone escaping from the gall bladder through the gall duct or by ulceration into the stomach or intestine, may result in intestinal obstruction. Following cholecystitis, whether acute or chronic, calcification and atrophy may result. Cholecystitis is usually associated with more or less localized peritonitis and resulting adhesions of the organ to the surrounding structures, including the liver, the stomach, the duodenum and transverse colon. Such adhesions also follow surgical operations upon the gall bladder tracts. Usually these adhesions are not dense enough to interfere in any way with the functions of the organs involved. In some instances, however, the adhesions may be so dense as to interfere especially with the motility of the stomach. This is more likely to occur when acute cholecystitis with empyema and resulting localized abscess has occurred.

Infection of the common bile duct with usually the presence of stone may result, as has been shown by Opie in infection of the pancreas through the pancreatic duct. Either acute or chronic pancreatitis may result. Chronic pancreatitis is far more common than the acute form and rare instances may result in such involvement of the whole pancreas, including the Islands of Langerhans that diabetes mellitus develops.

In acute cholecystitis with or without gallstones, the liver may be moderately enlarged and if palpable, usually is tender. As stated above, abscess of the liver may result from a phlegmonous cholecystitis. Chronic cholecystitis is usually associated sooner or later with slight enlargement of the liver and rather marked tenderness of the organ. When the hepatic or common duct is obstructed through infection or through gallstone, distention of the liver from accumulated bile results. If this condition is permitted to continue biliary cirrhosis occurs. Long standing chronic cholangitis is a serious condition associated as described above with periods of chill, fever, sweating, depression and jaundice. This has been called hepatic intermittent fever and before the period of the modern surgical relief of such conditions by drainage of the gall tracts, resulted in death. Cholecystitis with or without gallstones and especially when associated with biliary colic, often results in dynamic ileus. The condition is associated with nausea and vomiting, great distention of the abdomen, marked abdominal rigidity, tympanites and constipation. The condition is most like that produced by a rupture of any of the hollow viscera and septic peritonitis.

Functional Disturbances.—During attacks of acute cholecystitis or biliary colic there is usually nausea and vomiting. Between attacks of biliary colic the patient frequently complains of subjective disturbances of the stomach. There may be a sense of fullness and weight and more or less tendency to the eructation of gas after eating. This may be immediate or two or three hours after eating. Sometimes there is pain from one to two or three hours after eating and sometimes there is pain immediately after eating, especially if the patient take coarse food or take a full meal. The pain is usually of an aching, dragging character and may be referred to the epigastrium and sometimes to the right shoulder. Such disturbances of digestion may be continuous or are more likely to

occur at periods. Some patients are relieved by induced vomiting. Occasionally spontaneous vomiting occurs with relief, and occasionally some simple remedies, especially a carminative, seem to relieve the symptoms.

The Secretions of the Stomach in Gall Bladder Disease.—I have made an analysis of the conditions of sixty patients suffering from cholelithiasis to ascertain the secretions and motility of the stomach in this class of patients. These sixty patients have been selected out of three hundred and thirty-five patients, of whom I have histories, because in these sixty patients there were made careful observations of the digestive power of the stomach. Of these sixty patients fifty suffered from cholelithiasis with cholecystitis and ten suffered from cholecystitis with cholelithiasis of the gall bladder and the common duct.

The great majority of these patients presented practically a normal gastric juice. In a few instances the total acidity was high. In one 122; in two 112; in one 116. In a few the total acidity was low, practically an anacidity, with no more total acidity than would be expressed by the acid phosphates of a test meal. Of these one showed a total acidity of 9 and two of 10. All of the remainder showed an acidity within normal limits. An hyperchlorhydria as represented by a large amount of free HCl occurred in only a few. The record shows free HCl in one of 70; another 78, and two 88.

Motility was disturbed in forty-five of the sixty patients during acute exacerbations of the disease as shown by vomiting. A study of the motility of the stomach during intervals between paroxysms showed that there was practically never an anatomic insufficiency of the gastric muscle. The fasting stomach of the morning was invariably empty in every patient studied. In two patients the fasting stomach of the morning showed the presence of gastric juice without microscopic food remnants. In the same two patients a seven-hour motor meal showed the presence of gastric juice of a rather high acidity with a few food remnants. The remainder of the patients showed an entirely empty stomach with a seven-hour motor meal. The stools of these sixty patients showed an absence of chemical blood with two exceptions.

The analyses of the stomach condition of these sixty patients would seem to indicate that the digestive power of the stomach was not disturbed by cholecystitis excepting in the acute attack or in exacerbations of the chronic disease. During the acute attack or the exacerbation, the disturbance was due to the pain and was manifested by nausea, vomiting and usually anorexia.

Intestinal Function.—Constipation is the rule in cholecystitis and gallstone disease. With obstruction of the ducts and jaundice, there is the usual clay stool and fetor. Usually the absence of bile from the intestinal tract results in lessened intestinal peristalsis and the tendency to flatulence. There is also present in the stool a larger amount of free fat than in the normal condition because of the loss of the influence of the bile upon the digestive power of the succus enteritis and pancreatic juice.

Diagnosis.—The clinical course of gall bladder infections and cholelithiasis is quite uniform and a careful analysis of the symptoms and thorough investigation of the physical condition will usually enable one to make a diagnosis. Belly pain is a common condition. The nerve supply of the liver, gall bladder and ducts and the stomach, the appendix vermiformis and head of the colon is so nearly the same that pain alone or its location cannot be considered absolutely as a diagnostic point in the involvement of any of these structures. However, the pain of gall bladder infection and cystic duct involvement is usually located in the gall bladder region and is referred to the lower end of the sternum and epigastrium and often to the right scapular region. Furthermore, palpation upon the gall bladder region in this condition not only aggravates the local pain but especially intensifies the radiation to the ensiform appendix. Peritoneal adhesions between the gall bladder and surrounding structures may result from other conditions and cholecystitis, i. e.. chronic ulcer of the duodenum and stomach. Recent adhesions are often painful and chronic ulcer of the duodenum or stomach with perigastric or periduodenal adhesions with the gall bladder and liver may result in pain very similar to that due to gall bladder infection or gallstones. Occasionally pressure upon an infected gall bladder radiates toward the appendix vermiformis. Nephritic colic may be accompanied with the radiation of pain into the gall bladder region. Appendicitis as you know, may be accompanied by a pain referred to any point in the belly outside of the appendix region. Occasionally the appendix may be so situated that it lies near the gall bladder and an appendix in that location may present symptoms difficult to differentiate from cholecystitis. No careful physician will forget that acute infection of the pleura and lung may result in reflected pain along the lower intercostals to the belly with rigidity of the abdominal muscle and abdominal tenderness; that gastric crises of especially the early stage of locomotor ataxia may be mistaken for gall bladder infection. This is not an uncommon mistake. In the last five years I have had in the Presbyterian Hospital ten patients suffering from gastric crises of locomotor ataxia who had been operated upon for cholelithiasis. Pott's disease of the dorsal spine with resulting pressure upon the posterior nerve roots results in abdominal pain with rigidity of muscles and tenderness. Chronic ulcer of the stomach and duodenum usually has a classical and typical clinical course. A careful study of the patient's history, a careful physical examination and a study of the stomach secretions and motility and stool with the further fact that pain of chronic ulcer is relieved by proper diet, will enable a diagnosis to be made.

In other words, while a diagnosis may not be definitely made in every patient suffering with cholecystitis, acute or chronic with or without gallstones, a sufficiently careful examination of each individual will enable one to differentiate this disease from practically all others of the abdomen.

GALLSTONE DISEASE AND ITS RELATION TO INTESTINAL OBSTRUCTION.*

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History.—Obstructions of the gastro-intestinal tract by gallstones may be divided into two distinct epochs: First, that which preceded the appearance of the monograph of Courvoisier in 1890; and, second, the period from 1890 to 1910. In the later years, surgery has been the dominant treatment of gallstone disease. Courvoisier's epoch-making article which included practically all recorded cases in the Christian era, gave a new impetus to surgical thought on the subject of cholelithiasis. His forceful presentation of the pathologic conditions of gallstones in the gall-bladder, cystic duct, common duct, intestine, peritoneal cavity, etc., showed that there was a great field for mechanical intervention in lesions resulting from cholelithiasis. Following this, in 1892, came the invention of the Murphy button, which was first devised for the relief of conditions that developed from cholelithiasis. This mechanical aid gave a new impetus to the surgical treatment of gallstone lesions. Preceding the invention of the button, there had been performed but eleven operations of cholecystenterostomy and forty-seven operations of cholecystectomy. There were twenty efforts at removal of stones from the cystic duct. Langenbuch, reported by Kuemmel, had done his first case of removal of gallstones from the common duct under a definite diagnosis; and altogether four cases of extirpation of gallstones from the common duct had then been performed and desultory cases of intrahepatic stone removals were reported where the operation was performed not on a definite diagnosis but for the treatment of abscesses. The hepatic duct had been opened in 1888 by Knowsley Thornton, and in 1889 by Kocher. Choledochostomy had been done in 1886 by Ahlfeld and choledochoenterostomy attempted by Kocher. From this you will note that at the time of Courvoisier's publication the surgery of the gall-tracts was in its infancy. The surgery of obstruction to the bowel by gallstones had advanced further than the surgery of the biliary tracts themselves, as the stones produced lesions that immediately and greatly hazarded the life of the patient. Murchison collected up to that time 25 cases, Mossé 38, Lichtenstern 41, Béraud 13, and Courvoisier himself 131. The sex, age, etc., of 102 of Courvoisier's cases in which he was able to give these data are here analyzed:

	Male	Female	Total
20-30 years	..	1	1
30-40 years	1	4	5
40-50 years	3	9	12
50-60 years	6	15	21
60-70 years	7	14	21
70-80 years	6	11	17
80-90 years	..	2	2
?	8	15	23
			102

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In reviewing the statistics of abdominal surgery in 1890, after Senn had accomplished his master work in the abdomen, it seemed to me there was no other class of diseases left that offered so much for surgical attack as those of the biliary tract and liver. I therefore began, in 1890, experiments on dogs, and in 1892 perfected the button for gall-bladder and intestinal anastomosis.

The first case was operated on by me June 11, 1892, for an obstruction to the common duct by a large stone. The duct was surrounded by adhesions. A cholecystenterostomy was made. The patient made an uninterrupted recovery and I was able to keep track of her health for years after.

With the awakening of interest in surgery of the biliary tracts, one operation after another was quickly suggested, until to-day the surgery of this tract has reached a very high degree of perfection. In the specific relations of choleliths to intestinal obstruction, we can well analyze the pathologic lesions on the following basis:

1. The stones that pass through the wall of the gall-bladder into some portion of the intestinal tract.

2. The stones that pass through the wall of the cystic duct into the intestinal tract.

3. The stones that pass from the common duct by ulceration through its wall into the intestinal tract.

4. Stones that pass from the gall-bladder through the cystic and common ducts into the duodenum.

The rôle of gallstone in the intestinal tract represents the superlative degree of pathologic changes in the gallstone cycle. The points at which the gallstones produce obstruction in the intestinal tract can well be judged from Courvoisier's analysis of fifty-two cases, and we believe this represents the average position of arrest of the stones in the intestinal tract:

Duodenum	3	
Jejunum	4	
Upper jejunum	1	
	—	8
Upper ileum	4	
Middle ileum	1	
Ileum	18	
Lower ileum	10	
	—	33
Ileo-cecal valve	7	
Vermiform appendix	2	
	—	9
Sigmoid flexure	2	2
		52

These statistics of Courvoisier have an especial value as they show the clinical course in the cases preceding the era of frequent operations for gallstone diseases. They correspond fairly well with those of LeConte, Gibson, Lichtenstern, Moynihan, Woods, Porter and Murphy.

The positions of obstruction are very interesting. A lady 80 years of age had 22 stones in a diverticulum of the duodenum, which produced all sorts of digestive disturbances. In one patient there was an obstruc-

tion of the ileum by two stones not larger than a hazelnut, at the site of a malignant stricture. In two there were perforations of the appendix from impacted gallstones. In two others there were large conglomerate masses of cholelithe in the intestine. In a case reported by Bermond there was a mass of stones as large as two fists, and in one by Puyroyer a mass as large as the fist of one hand. Of 125 cases, 70, after various and repeated colics, emesis, peritonitis, ileus, etc., were cured spontaneously by the passage of the stones per anum. From the analysis of the cases, it was impossible to tell with any degree of certainty how the majority of the stones came into the intestinal tract, as in those cured spontaneously it was not ascertained and in many of those on which a post-mortem was made it was not recorded. In 36 cases in which the report was accurately given, the stones were passed into the intestine through a gall-bladder-duodenal fistula, in 25 cases a gall-bladder, ileum fistula, in one a colon fistula, in one a duodenal and colon fistula, and in seven a choledochus and duodenal fistula.

The size of the stones that can pass into the common duct by the wedge-shaped dilatation may well be estimated from an analysis of these cases: In one, where the patient died after five days symptoms of ileus, the stone measured four inches in circumference; the choledochus had contracted down after its passage to the size of an index finger. In another the patient died after fourteen days of icterus from a cholesterin stone impacted in the ileum. In one a herniectomy was performed for an incarcerated hernia, but without symptoms of obstruction in that zone, and it was found that there was an enormous gallstone filling the intestinal lumen. The choledochus was as large as the stone. In one there was an obstruction with two large cholesterin stones at the ileocecal valve. In this case there was no evidence of perforation of the surface of the gall-bladder, but the duct was still large. Another patient who had had an arrest of half of a large gallstone, died suddenly a few days later and it was found the other half had become impacted in the intestinal canal, ulcerated through its wall and caused a perforative peritonitis. The choledochus was dilated to the size of the gall-bladder. In still another instance, the patient died on the seventeenth day of the ileus from diffuse suppurative peritonitis due to an ulceration of the gallstone through the tract. In one instance, a lady aged 67 years, suffered four days from ileus, laparotomy was performed, two large gallstones were removed from the small intestine but she died in twenty-four hours from the septic peritonitis.

It will be noted in all of these cases that the ileus terminated fatally a long time after the onset of the symptoms of intestinal obstruction. That is due to the fact that the patients were suffering from an *obturation ileus,* that the stones were constantly changing their position and therefore did not perforate, and further that with obturation ileus the patient survives a much longer period of time than with strangulation ileus, notwithstanding that in both there is a complete retention of the material above the point of obturation. While a great majority of stones of large size find their way into the intestinal tract through ulceration of the gall-bladder, very large stones can and have been admitted through

the common duct. One of these large stones was encountered in the common duct of a doctor from Vancouver. It was one of the largest stones I have ever observed. It measured 1 7/8 inches in length and 1 1/8 inches in diameter. It came into the duct without a colic and was well on to the ampulla of Vater at the time it was removed. Its enormous size prevented the spasm of the duct, colic, that is usually present when small stones are passed. This case shows one of the exceptions to our law that "jaundice of any considerable duration not preceded or accompanied by a colic is not a gall-stone jaundice."

The intestinal obstruction by the stone itself may be analyzed as follows: The ileus due to gall-stone which has perforated through the gall-bladder into the intestine may have no preceding jaundice but the inflammatory symptoms which accompany such a perforation ought to suggest the diagnosis. There may have been colicky pains preceding the perforation by the stone while it was impacted in the neck of the gall-bladder but there is no colicky pain while the stone is in the fundus of the gall-bladder itself. If an ileus develops after an attack of colic or a prolonged colicky jaundice in women of middle age, the possibility of gallstones should be considered. If the stone perforates into the colon it causes few, if any symptoms, while when it perforates into the small intestine the characteristic attacks of ileus are produced and these may be repeated for months or years, depending on the advancement of the stone or arrest in diverticula in the intestinal tract. It may result finally in the escape of the stone into the large intestine, its ulceration through the wall of the intestine with perforation, peritonitis, etc. The arrests are more common a few inches above the ileo-cecal than in the ileo-cecal valve itself, as in the former position the lumen of the small intestine is less than at the ileo-cecal valve.

Symptoms.—While the early writers considered that a previous history of gallstones was present in only about 20 per cent. of the cases, they included only syndrome symptoms: pain, nausea and vomiting and icterus. In our observation icterus was present in only 14 per cent. of all of our cases operated on for gallstones, but other clinical evidence of gallstone disease was pronounced and clean-cut in the enormous percentage of them, so that the symptoms and signs of gallstone disease without jaundice will now be recognized as a part of the previous history of all cases of cholelithic obstruction.

In the use of the word ileus, we include not a pathologic entity but a syndrome of symptoms consisting of pain, nausea and vomiting, tympany, and coprostasis, one or the other of these accentuated in different degrees in individual cases. These symptoms may or may not be due to mechanical obstruction.

Intestinal obstruction may be defined as a complete or partial obstruction to the onward movement of the bowel contents, which obstruction is of *mechanic* origin. *Ileus* includes the stasis of the intestinal contents from excessive muscular contraction of the wall, *dynamic,* or paralysis of the peristaltic wave from any cause, *adynamic* or *mechanical* obstacles to the advancement of the fecal current, *mechanic.*

Obstruction may be unassociated with strangulation and this is the common condition in gallstone ileus, in intestinal polyps, enterolith, etc. Strangulation ileus involves not only the suspension of transmission of the intestinal content but a suspension or retardation of the circulation in the bowel segment. Strangulation ileus is a much more rapidly fatal condition than obturation ileus. In the recent investigations of the cause of deaths from ileus, efforts have been made to show that it is the absorption of the material retained above the point of obstruction that is the most potent factor in producing death. If this were true, complete obturation and strangulation ileus should terminate fatally in about the same period of time, which is not at all in consonance with clinical experience. There is some other element than the element of absorption of the intestinal contents. Whether that is the infection of the vascular system in the strangulation zone and when freed causes such a speedy and rapid collapse or some nerve phenomena, remains for the investigator of the future to determine. In a single case of gallstones we may have the three varieties of ileus:

1. The adynamic variety, while the stone is passing through the neck of the gall-bladder, cystic duct and common duct.

2. The dynamic variety, where a small stone produces a spasm of the intestinal wall with all of the symptoms of ileus and where the stone is much smaller than the lumen of the intestine, as reported by Courvoisier.

3. The mechanic variety, where the stone is large enough to completely occlude the lumen of the bowel and arrest the fecal current.

Symptoms of Intestinal Obstruction in Connection with Cholelithiasis.—The clinical history will show symptoms of pre-existing cholecystic disturbances, either colics and cholecystitis, or cholecystitis, colics and jaundice. These may have existed for a number of years preceding the intestinal obstruction. The intestine may be obstructed through adhesions or flexions of the intestinal tract produced by paracholecystitis. Volvulus and incarcerations may also occur as a result of gall-stones. The symptoms of the mechanical occlusion of the intestine are:

Pain, always of the colicky character. The spasm or colicky waves decrease in frequency after the first twenty-four hours. They may be re-excited after the muscle wall has become fatigued by long efforts at expulsion of the foreign body; by kneading or percussing the abdominal wall. The abdomen is not very sensitive to slow pressure in the early stage.

Emesis.—The appearance of the vomitus when the stone is high up is of the gastric and biliary type. When lower down it may take on the fecal color but rarely ever takes the typical fecal odor. The vomiting increases in frequency as the hours of the attack increase, until the stone either ceases to advance by becoming arrested in a diverticulum or escapes to a place where the intestinal content can pass by it. The quantity of emesis is less the nearer the stone to the pylorus. The great bulk of the material is made up of the transudation into the intestinal tract above the point of obstruction. It is not due to reversed peristalsis

but to the accumulated products of secretion and alimentation above the obstructing body. With the contraction of the intestinal wall the material cannot advance downward and must find its escape at the upper and only outlet. It therefore is forced back into the stomach and is ejected. In the beginning it is associated with nausea. As the case advances it becomes projectile; later it may become a mere gulp and flood over the patient's entire face. The vomitus is rarely ever fecal, that is, having the distinct odor of feces.

Borborygmus, peristalsis.—It is of the periodic type or wave. It usually begins some distance from the point of obstruction, increases as it approximates the point of obstruction and terminates in a loud explosion. The explosive point indicates the zone of obstruction. The stetho-

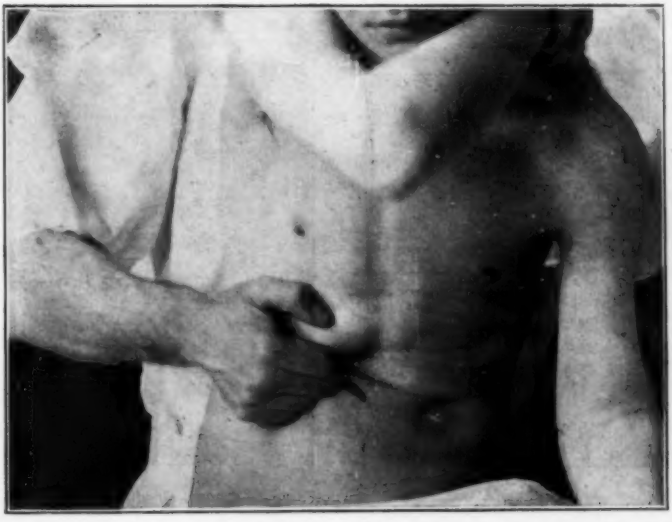

Fig. 1.—Shows the surgeon's hands hooked under the costal arch, to determine the sensitiveness of the gall-bladder. The patient cannot inspire against this pressure with an acutely inflamed or distended gall-bladder.—Murphy.

scope gives very valuable information in intestinal obstruction. A dose of morphin suspends the peristaltic waves from 6 to 8 hours and thus destroys one of the best aids to diagnosis.

Tympany.—This may be local or general: local, and in the upper abdominal region when the duodenum or upper jejunum is the site of obstruction; general, when the calculus is in the ileum or at the ileo-cecal valve. Circumscribed areas of flatness can frequently be discerned. They are due to accumulations of fluid above the point of obstruction. Their relations to definite obstructions were outlined by von Zoege Manteufel. Recurrent attacks of obstruction in these cases often develop great dilatation of the bowel above the obstructed zone.

Coprostasis forms the key stone of the arch of symptoms of intestinal obstruction. In obturation ileus small quantities of feces may be passed from time to time and even a litle gas. Both of them are misleading and lure the physician on in the hope that the ileus is of some other than the mechanic type, until perforation or other dangerous complications occur. The possibility of erroneously interpreting these signs should be borne in mind.

Temperance.—With mechanic obstruction of the intestine there is practically never an elevation of temperance in the first forty to sixty hours. Later, when gangrene and perforation have taken place temperature may appear. This absence of temperature is very valuable in differentiating mechanic obstruction from the infective lesions within the abdominal cavity.

Leukocytosis is, as a rule, only moderately increased. We have seen, however, a 36,000 leukocyte count in a case of mechanic ileus.

Fig. 2.—Shows the hand elevated, with the middle finger flexed perpendicularly at the tip of the ninth costal cartilage.—Murphy.

Fig. 3.—Shows the finger struck with the right hand when the patient is in deep inspiration. This causes great pain if the gall-bladder is distended or inflamed.—Murphy.

Differential diagnosis, will have to be made from, first, gallstone obstruction of the neck of the gall-bladder, cystic or common ducts. Second, from acute pancreatitis, infective, hemorrhagic and fat necrosis. This is the most difficult set from which to differentiate. The elevation of temperature, however, with the great sensitiveness in the abdominal cavity to pressure under the costal arch (Fig. 1) and perpendicular percussion (Figs. 2 and 3—Murphy) and the early collapse are valuable aids. Third, from tabetic crises. Fourth, from perforative peritonitis. Fifth, from appendicitis. Sixth, from acute renal lesions: (a) metastatic infarcts (hematogenous infection), (b) obstructions in the pelvis, (c) obstructions to the ureters. These acute kidney lesions give evidence of great pain on heavy fist percussion (Figs. 4 and 5—Murphy) over the

diseased kidney. The presence of blood in the urine, microscopically, will aid in the differentiation. Seventh, embolism of the mesenteric artery or thrombosis of the portal vein gives a train of symptoms so closely resembling those of acute mechanic obstruction, that pre-operative differential diagnosis is rarely made. Eighth, torsion of a tumor pedicle gives the pronounced symptoms of ileus but the presence of the tumor aids one in the diagnosis. Ninth, fecal impaction may be of the recurrent obturation type and only through the recognition of the fecal mass by palpation or proctoscopy with mega sigmoid or mega colon can it be differentiated.

Operation.—As many of the conditions mentioned above are of themselves surgical lesions, demanding immediate surgical treatment, the importance of differentiation is not so great as far as the life of the patient is concerned. These cases should be operated on at the earliest possible moment before there is time for perforations, peri-intestinal adhesions,

Fig. 4.—Shows the palm of the left hand pressed firmly over the right renal zone and the right elevated to make the stroke. —Murphy.

Fig. 5.—The stroke completed. When the kidney is actually inflamed, the pelvis distended or the ureters obstructed, there is great pain elicited by this blow; if the lesion is in the appendix or in the gall-bladder there is no pain produced.—Murphy.

intra-abdominal abscesses or acute intestinal obstructional collapse, a condition from which the patient rarely ever rallies. Delay in operating for intestinal obstruction is more fatal than delay in any other abdominal lesion, except acute gastro-intestinal perforations into the free peritoneal cavity. A free gastric lavage should be given immediately before operation. Local or general anesthetic may be used, both sparingly.

Location of incision. The incision should be made through either the right or left rectus muscle, over the point of greatest sensitiveness and the location of peristaltic explosion.

When the abdomen is opened, if all of the presenting coils are greatly distended, the hand should be passed into the pelvis to grasp the collapsed ileum as near the ileo-cecal valve as possible. This should be

rapidly run through the fingers in an upward direction, the assistant returning the coils into the peritoneum as rapidly as they are passed. When the dilated fixed point is reached, great care should be exercised not to tear the intestine where its wall is weakened by necrosis or ulceration from pressure by the calculus. If the wall is in fairly good condition it should be divided transversely and the calculus removed. The intestine should be closed by a double Lembert suture, thus turning into the lumen the fold that was most damaged by pressure from the calculus. In looking for points of obstruction, when the abdomen is opened there are dangers of missing the obstructions in the peri-duodenal subperitoneal pockets, diaphragmatic hernia, pericecal pockets and retrosigmoidal peritoneal diverticula. When the nutrition of the intestinal wall has been materially interfered with a resection of the bowel should be made and a goodly area of the bowel be removed. Many post-operative perforations have been due to the fact that too little of the infiltrated and damaged bowel above the point of obstruction was excised.

In the small intestine, the end to end operation is the one of choice, but when the wall is damaged, side to side or end to side by suture or oblong button gives the best results. Immediately after the laparotomy if the patient is materially depressed or collapsed an intravenous injection of 1.5 to 2 pints of salt solution should be administered before he leaves the table.

Many intestinal cases die cured of the obstruction, i. e., the collapse continues to a fatal termination a few hours after the operation. The exact cause of this collapse is unknown. It never occurs with patients operated on within a few hours after the onset of symptoms, not even when a number of feet of the intestine is resected. Cardiac, nerve or vaso-motor stimulants, with the possible exception of intra-venous injections of adrenalin, have little or no effect on these cases. Drainage is rarely ever indicated. Proctoclysis should be instituted as soon as the patient is returned to bed and a pint and a half of normal salt solution administered every two hours for 24 to 48 hours. Six to 8 ounces of solution has little or no value and the practice is not to be recommended. Anodynes are rarely ever indicated after operation. Heroin is the best where one is necessary.

THE LIMITATIONS OF SURGERY IN CHOLELITHIASIS.*

EMIL RIES, M.D.
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Operations as performed at the present time on account of cholelithiasis are usually successful as far as the primary mortality is concerned. Sepsis and hemorrhage have no greater terrors for the surgeon in this field than in most other fields of surgery. Only under special difficulties does hemorrhage threaten the success of the operation, namely, in the

* Read before the Chicago Medical Society, April 20, 1910, in a symposium on Gall-Bladder, Gall-Ducts and Liver.

case of patients who are severely jaundiced at the time of the operation. In these cases the hemorrhage at the time of the operation is supposed to be liable to be excessive, but my personal experience has not enabled me to confirm this teaching. Jaundice is also reported to favor secondary hemorrhage at a time more or less remote from the operation, but with the exception of one slight hemorrhage of this kind from a drained gall bladder, which was easily stopped by the application of adrenalin, I cannot report any such accident from my own experience.

Prolonged and severe vomiting of hemorrhagic stomach contents has in some cases in the literature led to the *exitus lethalis,* but as we have come to understand this condition better, it has lost much of its terror. The condition at times closely resembles that which is known as arterio-mesenterial occlusion or acute dilatation of the stomach. The resemblance lies particularly in the character of the vomited material and the persistence of the vomiting. Sometimes after gallstone operations we undoubtedly have to deal with real arterio-mesenterial occlusion such as is liable to follow a great variety of operations or may occur without any operation. These cases are treated with very satisfactory success by the postural method of turning the patient on the abdomen or raising the foot end of the bed to a considerable degree and by the stomach pump. But in a number of cases which I have observed, the clinical picture differed from that of arterio-mesenterial occlusion by two easily noted facts; first the absence of the dilatation of the stomach and second, the amount of the vomited material. Nobody who has ever seen any cases of true arterio-mesenterial occlusion will forget the surprising quantities of blackish fluid that pour out of these patients, nor is the distention of the stomach easily overlooked, if the examination is conducted at all properly. Some cases which I have observed after gallstone operations have been distinguished by the absence of these two cardinal symptoms of true arterio-mesenterial occlusion, though they presented persistent vomiting of blackish fluid. I believe that a number of these cases, none of which in my experience have ended fatally, have to be explained on a different pathologic basis from that of arterio-mesenterial occlusion. In the early days packing was resorted to to a considerably greater amount than is practiced at present and this large amount of foreign material placed in the abdominal cavity between stomach and duodenum on one side and the liver on the other could not, I believe, fail to compress the portal vein and some of its radicles to a serious degree. I am supported in this belief by two observations: first, that the vomiting always stopped completely and without further treatment as soon as the packing was removed and second, that since we use only very small amounts of packing, if any, this vomiting has become very much less frequent and less serious in its nature.

In case of cholelithiasis where the liver has been damaged to any extent by the chronic disease, the anesthetic is a very serious menace to the patient's life. Recent extensive investigations of Offergeld have shown again that the liver undergoes very intense pathologic changes, particularly fatty degeneration, after administration of ether or chloro-

form. Gas is decidedly less dangerous though the relaxation of the abdominal walls, which is so desirable for operations on the deeper bile ducts, is not always easily achieved under gas. Local anesthesia is of limited usefulness in this class of cases. Though it is perfectly feasible to incise the abdominal walls without producing pain, it becomes progressively more difficult to operate under local anesthesia the deeper the field of operation is located and the more it is necessary to handle or stretch those organs which are sensitive to pain. We know that the parietal peritoneum, the under surface of the liver and particularly the lesser omentum are very sensitive to manipulation and this excludes the use of local anesthesia just for the class of cases where it would be most desirable. The use of morphin scopolamin in conjunction with ether has proved very satisfactory in my experience, as considerable parts of the operation can be done without ether and, when ether becomes necessary, it is needed in only small quantities.

An operation may be entirely successful as far as the patient's life is concerned and yet the final outcome may be unsatisfactory. The limitations of complete surgical success are caused by general or local conditions. I shall not discuss here the more or less irreparable damage to the liver and pancreas and will only refer to one condition which is interesting to the surgeon in several respects, chronic morphinism.

Chronic morphinism is very liable to be produced by the oft-repeated administration of morphin during the course of gallstone disease. The removal of the stones does not always cure the morphinism though in many cases it is the only cure for this curse. I know one woman who now, ten years after the removal of her gall bladder, with the stones, is still a confirmed morphin eater and is thereby incapacitated for a useful life. It is important for the surgeon to know that and to what extent the patient has had morphin before the operation, because if he uses scopolamin morphin he will find a much larger dose of the morphin necessary than usual. On the other hand the case of the patient with chronic gallstone disease and morphinism demonstrates that morphin is a very safe anesthetic to use in gallstone operations.

Complete success of operations for cholelithiasis is jeopardized from three directions, which may be shortly characterized as: 1, the stones; 2, the infection; 3, the organs which are the seat of the disease.

Gallstone surgery unfortunately has not been able to profit from Roentgen's great discovery as much as the surgery of other concretions. The diagnosis of the seat of the stones can often be made very accurately from the symptoms, but this method of diagnosis is not infallible and must be supplemented by the examination of the ducts during the operation. The careful investigation of the entire system of bile-ducts is of paramount importance in every operation undertaken for the cure of cholelithiasis, even if the symptoms of the patient seem to point with great distinctness towards one and only one part of the bile ducts. The difficulties of this search for stones constitute one of the main limitations of surgery in this field. It is, of course, easy enough to clean a gall bladder of all stones which are floating in it, but often and much more

often than is commonly believed, gallstones are located in the wall of the gall bladder, particularly in those diverticula which I presented in microscopical pictures before this society some time ago. The difficulty of detecting gallstones increases with the distance from the tip of the gall bladder. The cystic duct has so many folds in its mucosa that it is very easy for a stone to remain undiscovered behind these, especially as probing the cystic duct is a very unsatisfactory procedure, almost impossible in ducts which are at all normal and only moderately successful in much distended ducts. The common duct and the hepatic ducts are lined with a very smooth membrane which has practically no folds and stones can not easily be retained there in folds of the mucosa. But there is no reliable way of finding stones in the intrahepatic bile-ducts. Undoubtedly they are of great rarity and this is fortunate for the surgeon, because no amount of probing or flushing of the ducts can lead to certainty as to presence or absence of intrahepatic calculi.

The larger the stone the greater the certainty of finding it whether it be in the gall bladder, the cystic duct or in any part of the hepatic and common ducts. But where we have to deal with those numerous small black or brown grains of gallstones, it is very hard to make absolutely sure that none of them have escaped us. It was for this class of cases particularly that Kehr recommended his method of sweeping out the common duct, which consists in introducing a strip of gauze through an incision in the common duct and bringing it out through the papilla in the incised duodenum. But Kehr himself has had the chagrin of having to reoperate on such a case for a stone which had not been removed in the first operation.

In cases of numerous and small stones the danger that diverticula in the gall bladder or folds of the cystic duct continue to shelter small calculi is very considerable. The best preventative of stones remaining behind in these organs is their removal by complete cholecystectomy. This is the reason why cholecystectomy continues to increase in favor among the most thorough gallstone surgeons. No amount of drainage of the gall bladder can guarantee that such a stone come out of its hiding place and float out. Electric illumination and even flushing the ducts are entirely unreliable.

If a stone should be left behind in any part of the bile system, that stone would be liable to lead to a recurrence of the symptoms. This kind of recurrence is a false recurrence, which means an incomplete operation. If in a second operation a single stone is removed and this stone has facettes, that fact would be logical evidence of its having been overlooked in the first operation. If in a second operation a stone should be found which is egg-shaped or round, it might have been overlooked in the first operation or it might be new-formed. The latter verdict would have to be passed also, if multiple facetted stones are found in a second operation.

We can speak of true recurrence only when all possibilities of the stone having been overlooked in the first operation can be fairly excluded. These true recurrences are undoubtedly rare and in this respect gallstone

disease reminds one of the immunity which one attack of typhoid produces. The fact that typhoid has been found the precursor of gallstone disease in as many as 33 per cent. of the cases is of further significance.

There is another kind of recurrence which is directly due to the operation and which has been observed in a few instances. This is the so-called thread recurrence, that is to say, a new formation of gallstone around some non-absorbable suture left in the bile-ducts. As the use of silk is dwindling the danger of such artificial recurrence is very slight. It is worth remembering, however, that heavily chromicized catgut at times lasts so long, that this danger of stone formation around the thread should forbid its use for suture of the bile-ducts.

Gallstone disease in its modern accepted meaning includes infection of the bile-ducts by one or more kinds of micro-organisms. It is surprising to see how bile-ducts full of pus will clean up in the short time of a few days or weeks, as soon as drainage of the bile to the outer world is provided for. Abscess in the neighborhood of the gall bladder, sometimes extending from the liver to the stomach and duodenum and large enough to contain a pint of pus or more, often containing numbers of gallstones, heal usually without difficulty when opened and drained. Abscess of the liver, if discovered, offers a fairly successful field for the surgeon. Nor is it the large abscess, intrahepatic or extrahepatic, which sets limits to the surgeon's success, but it is the smaller and multiple abscesses which after infection of the gall bladder have formed as metastases along the ramifications of the portal vein in the liver. These multiple and small abscesses may cause chronic disease or even death sooner or later, even after most careful and prolonged drainage of the bile system.

Whatever drainage may be able to do for the cure of an established infection of the bile system, it cannot be expected to prevent recurrence of the infection after the drainage opening has closed. And it can hardly be called a limitation of the surgery of the disease that it cannot prevent recurrence of the infection. As a matter of fact recurrence of infection, even without recurrence of gallstone formation, cannot be said to be at all frequent. Those infections at least which lead to formation of gallstones, appear to be practically prevented by the above-mentioned gallstone immunity and the same immunity appears to exist to a considerable degree with regard to any infection of the bile system subsequent to operative removal of the stones.

The organs which are the seats of gallstone disease though fairly well protected against true recurrence of stones and against recurrence of infection, are by no means always in a perfectly healthy condition as a result of the operation. In fact the very nature of the operations must produce or is liable to produce conditions which limit the success of the operation.

The long continued presence of stones and infection in the bile-ducts causes pathologic changes which are not easily eradicated.

Adhesions are a frequent finding in operations for cholelithiasis and though they may be broken up thoroughly in the course of the operation, it is impossible to say that they will not reform. Undoubtedly in many

cases these adhesions are the cause of various digestive disturbances continuing after operations. The greater the amount of adhesions broken up in the operation, the greater the amount of foreign bodies remaining as packing, etc., after the operation, the greater the chances for the formation of new adhesions. In this respect as well as in one to be mentionel later, I consider it of decided advantage to allow the patients to assume the sitting position. In fact we place our cases always in the sitting position immediately after the operation. If the patient is placed on his back horizontally with or without packing or a drain in the wound, the liver will have a tendency to rotate backwards and a large gap can form between the under-surface of the liver and mesocolon transversum and colon which may fill with serum, blood or clots and give rise subsequently to a considerable amount of new-formed connective tissue, which would appear as extensive and thick adhesions between these organs. If, on the contrary, the patient is sitting up, the under-surface of the liver has a decided direction downward and forward and is falling directly over the lesser omentum and the mesocolon. The escape of any fluid from the under-surface of the liver is in the most natural direction, downwards, and adhesions, though they will form here also, will be much thinner and more easily broken up afterwards, as all peritoneal adhesions tend to be broken up after the extinction of infection. But in many cases of chronic disease preceding the operation the adhesions have caused very serious disturbances in the normal relations of neighboring organs which the operation cannot remedy and the consequences of which limit the success of the operation.

The joy of a successfully performed operation is sometimes clouded by the occurrence of hernia in the scar of the incision. These hernias were of much more serious import in the days when the rectus muscle was cut transversely for the purpose of operations on the bile-ducts. This incision being no longer practiced, we rarely obtain a chance of observing very extensive hernias, but it certainly cannot be called an unlimited success if the patient emerges from the gallstone operation with a hernia the size of a head, the surgical cure of which is sometimes by no means easy. However, hernias occur also after incisions of more approved pattern. The lower the incision is made, the longer it is kept open, the more it becomes infected, the more certain is the occurrence of a large and uncomfortable hernia. Where there is no infection of the wound, where there is only a small amount of packing or drainage and that removed early and particularly if the incision is made high up, the chances for the occurrence of a hernia are very much more limited. As in the upright position of the body the anterior surface of the liver tends to come downwards and forwards, we advise our patients to sit up early and as much as possible after gallstone operations. The anterior surface of the liver then tends to act as an obstruction of the opening in the abdominal wall. The importance of this action of the liver is further demonstrated by the fact that incisions close to the border of the ribs or between the ensiform and the border of the ribs hardly ever lead to hernia formation.

The operations on the bile-ducts themselves are liable to produce more or less undesirable after-effects by themselves and the proper choice of operation for a given case is of the utmost importance for a perfect result.

Cholecystendysis, the incision of the gall bladder with removal of stone or stones from the gall bladder and immediate suture of bladder was called the ideal operation. But as it excludes the treatment of the infection by drainage it is now used in only a very limited number of cases.

Cholecystostomy, the operation of draining the gall bladder, is a very safe operation with a very low mortality. It affords ready drainage of the bile tract. It does not guarantee complete removal of the stones in the gall bladder. The communication made between gall bladder and the surface of the body is liable to remain open for various reasons, the two most important being a stone overlooked in the cystic or common duct and faulty attachment of the gall bladder. These fistulas sometimes cause considerable trouble, first, because of the escape of the bile to the outside, which means the loss of the function of the bile in the intestine, and second, because of the constant necessity of dressings which keep the patient wet and uncomfortable.

Cholecystectomy, if done with removal of the cystic duct, protects very well against future development of stones in the gall bladder and cystic duct. It necessarily leads to more or less adhesions on the under-surface of the liver over the more or less exposed bed of the gall bladder. It also has been stated that if at any time subsequent to the cholecystectomy the common duct should become hopelessly obstructed by stricture or neoplasm, it would be impossible to make a satisfactory connection between the bile ducts and the intestine if there was no gall bladder to be utilized for a cholecystenterostomosis. In this respect, however, the experience of recent years has demonstrated first, that after removal of the gall bladder the common duct dilates to a considerable extent, second, that such dilated common ducts can be utilized successfully for anastomosis with the duodenum and third, that resection and suture of the common duct is perfectly feasible. In only two cases which I know of patients have complained after cholecystectomy that they had an almost constant bitter taste in the mouth, though no other symptoms of gall-stone disease were present.

The anastomosing operations between gall bladder and any part of the bowel from the stomach down to the colon are sometimes unavoidable. They are the more liable to result in infection of the gall bladder the further away from the stomach the anastomosis is made. The duodenum is almost always the point to which to anastomose the gall bladder. But the stomach has also been used with good success and it is surprising to find that the presence of bile in the stomach does not seem to affect the patients at all unfavorably.

Choledochostomy, the operation of incision and drainage of the common duct, at present is pretty generally preferred to choledochotomy with suture. Even long incisions in the common duct usually heal well

in a few weeks if only the common duct has free communication with the duodenum. Drainage of the whole bile tract is certainly accomplished most successfully through the common duct.

In summing up, we may say that the technical part of the surgery of cholelithiasis has reached a very high and satisfactory stage of development and that the limitations of surgical success are few, and those due more to pathological conditions preceding the operation than to any shortcomings of the art of surgery.

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GALL-TRACT INFECTION.*

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Gall-tract infection is primarily a medical disease. If the family practitioner fails to diagnose and cure it, it then becomes a surgical disease.

After the surgeon operates the patient should again be returned to the family doctor and by his skillful management alone can health be restored. The general practitioner should be very alert to the possibility of gall tract tenderness and infection while treating any of the germinal conditions. The organisms most frequently found are the colon bacillus, the typhoid bacillus and the ordinary pyogenic cocci. Harris has secured pure typhoid cultures from the gall bladder eighteen years after the patient has had the fever.

The famous case of Mary Mellon is known to you all. When the gall bladder becomes infected it may persist simply as a chronic cholecystitis for an indefinite time, without the formation of gallstones. However, the stones may form quite rapidly and grow to considerable size, and when once formed they tend to perpetuate the chronic inflammation.

Gallstones are always due to an infection of the gall bladder or the gall tract. When we remember that it has been estimated that one person out of every thirteen has gallstones the importance to the general practitioner of gall-tract infection becomes at once apparent. Gallstones may be produced experimentally by inoculating the gall bladder with micro-organisms, but they must be of an attenuated virulence.

Gallstone formation is therefore seldom produced by severe acute infection of the gall-tract, but by an infection of a mild and chronic type. This accounts for the multitude of cases found post-mortem which the general practitioner has never suspected, and whose symptoms have been passed over under the head of chronic dyspepsia.

Not only must there be micro-organism present to produce the inflammatory changes, but such other factors as shall produce stagnation of the bile, or its delayed escape, so that the germs may have time to develop and to acquire lodgment in the mucosa. The growth of the germs causes

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* Read at the Sixtieth Annual Meeting of the Illinois State Medical Society, at Danville, May, 1910.

a change in the reaction of the bile, and the cholesterin, the chief constituent of the majority of gall stones is precipitated or crystallized about detached masses of epithelial cells or masses of bacteria, products of inflammation which act as nuclei for the formation of stones.

Gallstones are therefore a secondary or accidental condition due to the chief or primary condition, gall-tract infection. Such being the case it is the duty of the general practitioner to diagnose these cases early, and to refer them to a competent surgeon, that they may be operated on during the period of safety.

Gallstones by migrating along the ducts may cause serious complications. The most noteworthy is gallstone colic. The colic, however, may be produced by masses of mucus or débris being forced along the inflamed tracts, and the general practitioner should always so state to the patient. The patient should be told that the gall-tract infection will eventually lead to the formation of gallstones, so that if stones are not found he will understand that a necessary operation has been done, and that he is saved from the more dangerous one when stones are present.

Stones may lodge in the cystic duct, causing obstruction with empyema of the gall bladder. They may lodge in the common duct, producing jaundice and bile in the urine. When infection extends through the wall of the gall bladder or of the ducts adhesions form to the adjoining structures, to the colon, to the duodenum, to the stomach, to the omentum, to the liver and to the abdominal walls. These adhesions give rise to other symptoms, depending upon the particular organ or organs involved, and to the extent to which their functions are interfered with.

A characteristic feature of the symptoms of all these conditions is their discontinuity, viz: attacks and remissions. The longer the conditions persist the more likely we are to find pericystic adhesions, complications from migrations of stones, etc.

When there is suspicion of gall-tract infection, one should have all his life habits carefully regulated, as all conditions favoring stagnation of bile favor infection, and should be done away with, such as sedentary occupations, lack of exercise, depressing mental emotions.

The chief etiologic cause, however, is a depressed circulation associated with catarrhal duodenitis. In cholecystitis, with or without gall stones, the normal rugosity of the mucous membrane has been found partly or completely obliterated, the mucosa and submucosa filled with acinous masses, the muscular tissue greatly hypertrophied. The blood vessels and the lymph vessels are more numerous and show marked thickening with sclerosis of the walls. When the process is due to extension from the pars duodenalis the mucous membrane has been found swollen and a plug of inspissated mucus filling the diverticulum of Vater, completely obstructing the outflow of bile, causing jaundice, and this may occur without gall stones.

In empyema of the gall bladder the organ sometimes contains a pint or more of pus. In phlegmonous cholecystitis, which is fortunately rare, there is usually rupture with peritonitis and a fatal outcome. In cases not properly treated the condition goes on from bad to worse. Adhesions

to surrounding parts sometimes make operation impossible. Xanthematous masses appear. Sometimes the gall bladder atrophies until no larger than a pea. Cases are on record where it has enlarged until it sunk into the pelvis. Occasionally ulceration and fistulous tracts appear. I have seen one case where a gallstone worked out of an opening in the groin. In this case the diagnosis had not been made by the physician in charge of the case.

In acute infection cholecystitis the gall bladder is usually tense and distended, its contents usually dark in color, mucopurulent, purulent or hemorrhagic, and there may be a very foul odor. The cystic duct is often found closed even when there is no stone. The end results of infection recently reported by Bayard Holmes and Robert Babcock is brown atrophy of the heart with arteriosclerosis, first central, then peripheral.

The symptoms noticed, aside from tenderness over the gall tract are often those of dyspeptic nature, with uneasy feelings in the region of the liver, and pains in the back and limbs. Often a full feeling is noticed in the abdomen, then the patient gradually becomes jaundiced. Attacks of colic may come on attended by profuse sweating, nausea and vomiting and a tendency to faintness. The heart action in all these cases is weak. After the attack there is great soreness over the bile tracts until the acute symptoms subside. If the condition goes on to the formation of stones, the patient is constantly more or less miserable.

John B. Deaver, in his late address, remarks: "It is a common statement of the text-books, that most cases of gallstones give no symptoms, and that many cases are found post-mortem which could not be diagnosed in life. I believe that both these statements are incorrect. It would be entirely true for us to say, that in most instances gallstones do not manifest themselves by the symptoms which are commonly supposed to be the only ones which denote their presence, yet many a case of chronic dyspepsia, flatulence, anorexia, etc., is found in the end to be "latent" or "symptomless" biliary calculi. I find in looking over my case histories that this is the story time and again; that the patients have led lives of misery while the cause of their sufferings was unrecognized. Not only does early diagnosis relieve the patient of great distress and suffering, but it enables us to deal with those cases without being hindered by those complications and pathologic changes which invariably arise in cases of long standing."

After such warning we should be very careful in making an early diagnosis. Patients with slow pulse and arrhythmia should be examined with this end in view. Cases of sweating of some local part of the body as one hand, one side of the face, etc., very often have a cholecystitis for their origin, and finally all cases of dyspepsia should be carefully gone over with the object of discovering if gall tract infection may not be a factor in the diagnosis.

The essential factor in the treatment consists, first, in the free drainage of the gall tracts by a competent operator, and none other should attempt these cases. The operation of cholecystostomy is sufficient when

disease is limited to the gall bladder. When stones are present, they should be removed. When complications are present they should be dealt with and adhesions should be freed. When the gall bladder is so badly damaged that complete *restitutio ad integrum* does not seem likely to occur, it should be removed. It should also be removed when the cystic duct is permanently occluded. Stones in the common or hepatic duct should be removed with tubular drainage of these ducts, and drainage in all cases should be maintained until the bile flows clear and sterile.

The mortality increases in direct proportion to the complications present. It is least in simple cholecystostomy, and greatest in common duct stones with active infection of the tracts present, which is another indication in favor of early operations before complications arise. When the surgeon is done with the patient he should return him to the practitioner after telling him that he will need careful treatment for many months.

All stomach ailments should be removed. The mouth and teeth should be cared for and the patient taught to properly masticate the food. The flow of bile should be watched for in the stools and it must not be allowed to stagnate. Constipation must be removed; sedentary patients be made to exercise. The stooping habit, which many of these patients have, must be prohibited. When a feeling of fullness or discomfort is felt in the region of the liver, then purgatives should be used. All care must be taken to restore the normal tone of the heart.

REPORT OF TWO CASES OF ACUTE PERFORATING GASTRIC ULCER REQUIRING GASTROJEJUNOSTOMY AS A SECONDARY OPERATION—RECOVERY.

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Acute perforation of the stomach is such a disastrous complication of gastric ulcer that a report of such cases with recovery is a matter of considerable surgical interest.

My first case has been previously reported[1] but I again present it here for the purpose of adding some interesting data to the subsequent history. The first report is as follows:

Case 1.—H. W. G., a male, aged 62 years. In November, 1907, began to have distress in stomach with slight pain after taking food. In December had dizzy spells and very sour eructations. December 26 had a severe attack of dizziness, vomiting and fainting. Was confined to bed two days. Distress in stomach, sour eructations and occasional vomiting continued. By July 1, 1908, food could be retained only one hour. August 24, nine months after the beginning of stomach symptoms, I saw the patient and ordered a test meal and stomach analysis; this

1. Allaben, J. E.: Surgical Treatment of Perforating Gastric and Duodenal Ulcer, with Report of a Case of Perforating Gastric Ulcer; Recovery, Illinois Medical Journal, August, 1909.

showed hyperacidity, a few blood corpuscles and the usual condition characteristic of gastric ulcer. Operation advised. At midnight two days later the patient vomited a half pint of fluid having the appearance of coffee grounds in which were some streaks of blood. At 3 o'clock the same night he was awakened and cried out with an intense pain in the stomach and a few minutes later was found upon the floor by members of the household, suffering agonizing pain.

A diagnosis of gastric perforation was made, the patient removed to the Rockford Hospital and a laparotomy done three hours from the time perforation occurred. A perforation was found in the anterior stomach wall about one inch from the pylorus, through which I could pass my index finger. The perforation was closed, first, by linen interrupted Lembert sutures; second, purse-string suture; third, a graft from the gastro-hepatic omentum.

The base of the ulcer was greatly indurated and very friable, so that little tension could be made upon the sutures. The case progressed without symptoms for three weeks, when vomiting began, and for two days everything put into the stomach was rejected. It was evident that the ulcer in healing had produced an obstruction of the pylorus. A posterior no-loop gastrojejunostomy was done. The patient made a good recovery. I saw this patient a few days ago, and now, after nine months, he is well, in good flesh, and is suffering in no way from stomach trouble.

The above report was written nine months after the patient was operated upon. Since then one year has been added to the history. During the first ten months of this last year's history, the patient enjoyed excellent health. For the last two months his health has gradually declined. He has had considerable pain in the epigastric region, has been losing flesh, is anemic and he has the facial expression of malignancy. His present symptoms are due undoubtedly to carcinoma of the stomach. That there is no obstruction at the site of the gastrojejunostomy is evident from the fact that there is an entire absence of vomiting, and from the fact that the pain is independent of the taking of food.

Glancing backward over the early history, we observe that symptoms of pyloric obstruction occurred almost simultaneously with the symptoms of gastric ulcer. The question then arises: Is this a case primarily of ulcerating carcinoma perforating the stomach, or one of ulcer upon the base of which carcinoma has been implanted secondarily? In view of the full history, we would say that it is primarily a carcinoma with secondary ulceration.

From a study of the material from 216 partial gastrectomies for ulcer, ulcer and carcinoma and carcinoma, in the Mayos' clinics, Dr. MacCarty in his conclusions says:[2]

Case 2.—Through the courtesy of Drs. Crowell and Stevens of Rochelle, Ill., I saw the following case:

Miss A. T., aged 46 years. At midnight May 20, 1909, while vomiting, the patient was taken with intense pain in the epigastrium. Patient remarked that she had "broken something inside." Her attending physician stated that shock was not pronounced and that the pulse and temperature showed but little change until 4 o'clock the following day. I saw the case about 5:30 on the afternoon of the same day; pulse 116, temperature 99.3; respiration 14. Moderate distention and rigidity of abdomen. Facial expression good. The previous history shows that she suffered greatly from stomach trouble since 1882, a period covering twenty-seven years. During these years she had sour stomach, "water brash," a clear, sparkling water would run out of her mouth, she being unable to control it. Pain was considerable and most pronounced three or four hours after meals and

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2. MacCarty, Wm. Carpenter: Pathology and Clinical Significance of Stomach Ulcer, from a Study of the Material from 216 Partial Gastrectomies for Ulcer, Ulcer and Carcinoma and Carcinoma, Surg., Gynec. and Obst., May 1910, pp. 449-462.

One cannot say positively that all carcinomata of the stomach has developed on ulcer, because carcinomatous tissue in the base of an ulcer may be an ulcerated primary carcinoma.

was relieved by taking food or by induced vomiting. Pain was especially pronounced after 4 o'clock in the afternoon and during the night. During the last year all of these symptoms became more pronounced.

The patient was transported 28 miles on a cot in a baggage car to the Rockford Hospital and operated on at midnight 24 hours from the time of perforation. The perforation was directly through the pyloric ring, the ulcer apparently being half way within the pylorus and half within the duodenum, and was about the size of a lead pencil. There was no induration whatever about the site of the ulcer. The perforation was closed with linen suture. The stomach was dilated and prolapsed to two inches below the umbilicus. The abdomen, which was filled with pus and gastric contents, was drained by rubber tubing. After closing the wound in the upper abdomen about the drains an opening was made in the appendiceal region and two rubber drains passed into the pelvis. The appendix was removed and a rubber catheter passed through the appendix stump into the colon about two inches and secured by a purse-string catgut suture.

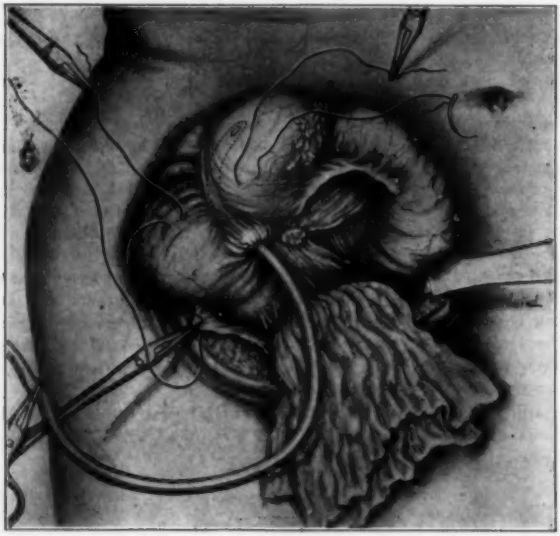

Fig. 1.—Catheter inserted into cecum through stump of appendix and secured by purse-string suture. On one side is shown stay suture passing through parietal peritoneum and serous coat of cecum ready to tie after the intestine has been replaced within the abdomen. The appearance of the wound after operation, and method of giving salt solution, are shown in Figure 2. (Illustration loaned by JOUR. AM. MED. ASSN.).

Through this catheter physiologic salt solution was administered, at first quite freely and later by the drop method. The patient made a good recovery. Mopping or irrigation of the peritoneal cavity was not employed in either case. The catheter was removed on the fifth day. A small fecal fistula resulted, but closed permanently in a few days. Two months from the date of the operation for perforation I was obliged to do a gastrojejunostomy (posterior no-loop method) for pyloric obstruction, from which the patient made a rapid recovery.

A year has passed since the operation and the patient is in better health than for twenty-seven years.

In view of a retrospective study of the symptoms and of the morbid conditions found at the time of the operation or of the gross "pathology of the living" as Moynihan might term it, how can we profit in dealing with similar cases in the future?

As to the first case I would say that inasmuch as the perforation occurred quite near the pylorus, and the perforating ulcer was surrounded by a hard mass that must be either inflammatory or carcinomatous infiltration and inasmuch as the symptoms of gastric ulcer and pyloric obstruction appeared almost simultaneously as a part of the stomach symptoms and inasmuch as the peritoneum was not badly soiled owing to an empty condition of the stomach at the time of perforation and the patient's condition being fairly good, I think a gastrojejunostomy was indicated at the time the perforation was repaired.

Assuming that a gastrojejunostomy had been done at this time and that a diagnosis of probable carcinoma had been made, should a resection of the ulcer bearing area as recommended by Rodman have been undertaken as a secondary operation? Inasmuch as the operation is attended

Fig. 2—Patient held in Fowler's position by twisted sheet. By using comforts and pillows the shoulder-rest may be dispensed with. C, catheter held in cecum by sutures; I. P., glass irrigating point; T, thermometer. Temperature of solution 100 to 110 F.

by a considerable mortality, and inasmuch as we could not hope to prolong life more than from two to five years it would not have been justifiable.

In patients like the second case where the perforation is of twenty-four hours standing and with extensive soiling of the peritoneum, repair of the perforation and drainage is all that can be undertaken and gastrojejunostomy should be performed as a secondary operation as soon as symptoms of pyloric obstruction appear. The immediate results of gastrojejunostomy is one of the most satisfactory in surgery. The most likely complication in after results is probably peptic ulcer within the jejunum.

Regarding the success of this operation in any individual case Moynihan says:[3]

3. Moynihan, B. G. A., Gastroenterostomy and After, Brit. Med. Jour., May 9, 1908; and Pathology of the Living and Other Essays, W. B. Sanders Co., 1910.

That is a question that may be answered satisfactory only after the lapse of many months. In an operation of the severity of gastroenterostomy, an operation moreover by which certain physiologic principles seem to be set at naught, the lapse of two years is certainly not too much to allow us to speak with confidence as to its success.

The after treatment of perforating ulcer consists in placing the patient in Fowler's position, administering physiologic salt solution by the rectum or through the cecum (Fig. 2) and withholding food for three or four days.

When convalescence is established in cases where the stomach is considerably dilated as in my second case, lavage should be a part of the after treatment for a few weeks, thus preventing farther dilation by retention and fermentation of food and for allowing the distended atonic organ to regain its normal tonicity.

TUMORS OF THE TONGUE, BENIGN AND MALIGNANT.*

EMANUEL FRIEND, M.D.

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CHICAGO.

The mucous membrane of the cavity of the mouth is derived from the epiblast and is frequently the seat of both papilloma and carcinoma, examples of which I wish to present to you to-night. The favorite localities are the mucous membrane of the cheek, the prolabium of the lip, the tongue, the soft palate and the pharynx.

In this connection, I wish to emphasize the importance of an *early* diagnosis in all ulcerative and neoplastic enlargements occupying these localities. It seems to me that histopathology as an aid to diagnosis is probably more neglected in this particular field than in any other, and why such should be the case I cannot understand. Henry T. Butlin, in an excellent article in the *British Medical Journal*, on the very early conditions of cancer of the tongue, classifies these conditions as follows:

1. Predisposing conditions, such as leukoplakia, ichthyosis, chronic superficial glossitis, which may exist for many years without the occurrence of cancer, but which undoubtedly render the individual much more liable to cancer than are individuals in whom the tongue is healthy.

2. Precancerous conditions, such as wart growths, thick plaques, sore places, which are not actually cancerous, but which inevitably proceed to cancer unless they are completely removed or destroyed.

3. Actual cancer, in one of its various forms, when it is obvious to an educated surgeon, and ought to excite suspicion in the minds of persons who are not experts.

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* Read before the Chicago Medical Society, May 31, 1909.

I herewith append plates of cases illustrative of this condition (Figs. 1-6), and wish to report later a case which I had under treatment in an advanced stage, for which operation was advised as soon as the diagnosis was confirmed by a histologic section, but declined. The histories of the first two cases, namely, those of papilloma of the tongue, are as follows:

Figure 1

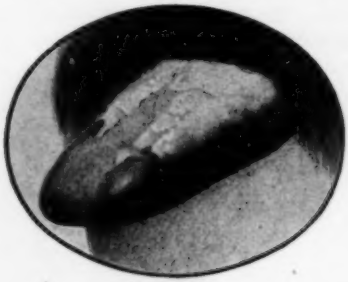

Figure 2

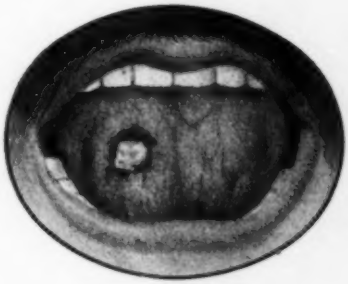

Figure 3

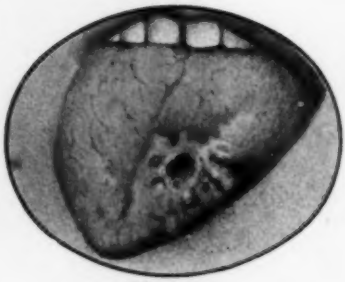

Figure 4

Figure 5

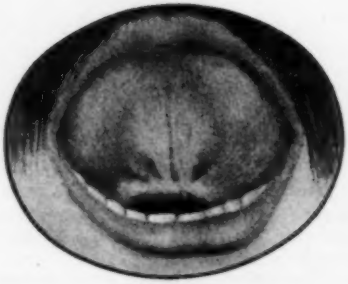

Figure 6

J. B., American, aged 35 years; married. Bartender by occupation. Was referred to me for operation by Dr. Robert Sonnenschein, with the following history:

Previous illnesses: Patient had syphilis sixteen years ago; was treated for some time. Family history: Negative. Present illness: Two years ago he

noticed a small red nodule on the front and right side of his tongue. This assumed a cauliflower, ragged appearance; no pain was experienced. The mass has shown a rather rapid growth during the past few months.

Status præsens: Patient is well nourished; appetite good; sleeps well. The tongue shows a large tumor mass, occupying the right anterior quadrant, somewhat pedunculated, although with a rather wide base, which was firm in consistency in contradistinction to the tumor mass itself, and which had to my mind the appearance of blastomycotic tissue. It was very friable and bled easily on manipulation. The regional lymphatics, supraclavicular, and axillary glands were not enlarged.

Figure 7

Treatment by Dr. Sonnenschein was mercury and potassium iodid, the latter pushed to 150 grains a day, and given for some weeks, without affecting the tumor in any way. Patient's weight showed an increase from 165 to 171½ pounds.

Histological examination: A section of the tumor showed a papillomatous growth, with marked epithelial proliferation and karyokinetic changes.

The case was admitted to my service at the Michael Reese Hospital.

Operation: Ether anesthesia; no preliminary atropin. Head in elevated position. Preliminary ligation of the ranine artery, well removed from the site of operation. Excision of the anterior right quadrant of the tongue, some distance from the indurated pedicle, care being taken not to injure or occlude Wharton's duct. After ligature of a few bleeding points, interrupted catgut

sutures were used to bring the wound surfaces together. Liquid diet and a mouth wash of potassium permanganate advised. Uninterrupted recovery.

Dr. Herzog has kindly furnished me with the following histo-pathological report: The mass removed is about one inch square and over one-half an inch in thickness. It presents an irregular papillary surface, and a somewhat constricted base. Transverse section shows a very considerable thickening of the epithelial layers. It appears that the proliferating epithelial cells have, however, not really broken into and destroyed underlying connective tissue, but merely pushed it in front of themselves. Thickened epithelial layers are surrounded by a powerful wall of inflammatory tissue. The latter is composed almost exclusively

Figure 8

of small, round, mononuclear cells. Eosinophilic and plasma cells are exceedingly scanty. The proliferating epithelium here and there includes little abscesses, in which the polymorphonuclear leucocytes predominate; no blastomyces were found in these abscesses, or in any other part of the tissue. The mass removed is very probably not a carcinoma, but a papilloma, somewhat indefinite in its nature.

The second case, referred to me by Dr. G. W. Wagner, with the following history was admitted to the Michael Reese Hospital:

H. B., aged 61 years; occupation, butcher; nationality, Russian. Married twice; four children with the first wife; five children with the second wife. Has resided in America one and one-half years. Denies venereal history; no history of miscarriages in the wives.

Status præsens: Patient is a well nourished individual for his age; states that some three months ago he bit his tongue, which bled profusely, and was controlled by a cotton pad. Following this some four weeks he first noticed a beginning enlargement on the site of the injury, which has grown to the size of a navy bean. He complains of no pain, but, as in the previous case, is only troubled by reason of its mechanical presence. His appetite is good; sleeps well, and has not lost in weight.

The tumor mass had a more firm consistency than in the previous case, and its pedicle was more slender and its vascularity not so marked; at least, it did not bleed so easily on manipulation. The regional, as well as the supraclavicular and axillary lymphatics were no more enlarged than the numerous carious teeth might have produced.

Figure 9

Operation: Cocain, 2 per cent., injected into the base of the tumor, accomplished a good anesthesia, and a wedge-shaped piece of the tongue was excised, corresponding to and extending a short distance from the base of the tumor mass, and the wound closed by interrupted catgut sutures, and a mouth wash of potassium permanganate solution recommended.

The histo-pathologic report in this case was also kindly furnished me by Dr. Herzog, as follows: The main mass of the tumor removed is composed of fibrous connective tissue. The external surface is covered with thickened layers of epithelia, but the latter have not proliferated into the connective tissue. On the interior of the neoplasm there are found masses of small round or irregularly polygonal cells, which appear to take their origin from lymphatic endothelia.

This group of cells, on the whole, looks more like a subacute inflammatory reaction than a true neoplastic formation. Histologic diagnosis: Non-malignant fibroma molle or papilloma of the tongue.

The third case is one which I had under treatment some few months ago, and who absolutely refused excision of the tongue, so strongly indicated. The history is quite characteristic, growing out of a long-standing leukoplakia of the tongue, which probably was the underlying locus minoris resistentiæ, allowing of this atypical proliferation of epithelial cells, which has resulted in a typical rapidly proliferating carcinoma of the tongue, and corresponds to three cases referred to in Senn's book on tumors, which I reported, of epithelioma of the face developed in lupus vulgaris, in which probably the lupus was the underlying locus minoris resistentiæ. His history, as written by himself, is as follows:

Figure 10

Age, 46; no venereal infection. About four years ago, while sick with appendicitis, my nurse called attention to a white spot on the upper part of the right side of my tongue; also two smaller white spots on the cheek. I used listerine and other mouth washes, but it had no effect. I called on Dr. A., who pronounced it psoriasis of the tongue, and prescribed for me, but the medicine had no effect. About three years ago I called on Dr. B., and he suggested *x*-ray treatments, and said the disease is known as leukoplakia, and there is no known remedy for it. I continued the *x*-ray treatment for about eighteen months.

There were times during the treatment when Dr. B. thought the trouble was being cured, but these favorable indications were but temporary, and after

eighteen months of treatment the spots on my tongue had grown in size, and a much larger part had become involved. The lower part of the tongue was then almost completely coated. Dr. B. then told me that his brother had just returned from Europe, and while there he made it his especial business to consult eminent French specialists regarding my case, and that a noted French physician claimed that he had had many similar cases, and that he succeeded in curing all of his patients by injecting mercury. Dr. B. advised me to take this treatment, and I did. I began taking the mercury injections on December 1; after taking the treatment about three months, I experienced severe pains in my teeth and gums. The treatment was continued, with some intermissions, until about June 15, and I have taken no treatment since. My tongue has shown no improvement during the time of the mercury treatment.

About July 20th a spot on my tongue which had always been extremely painful and sensitive to touch broke open. This spot was about the size of a pea. Dr. B. examined me and pronounced it an abscess, caused by some infection, which would soon get better. The wound has been getting larger almost every day, and my gums and teeth are becoming more painful every day.

Last Monday Dr. C., who had charge of my case (Dr. B. being out of town) consulted with Drs. D. and E.; they decided on a treatment of very large doses of iodid of potassium; also suggested that a small piece of the tongue be clipped off for microscopic examination, which Dr. C. did not think necessary, and consequently did not do. Dr. C. has been cleansing the wound every day. He says it is healing up from below, and is getting better. I have lost about fifteen pounds since July 15. My appetite is poor, and I eat but very little solid food, mostly liquids. I get no sleep, on account of extreme pains in the gums and teeth. The saliva runs from my mouth almost all day and night.

The patient presented himself to me Oct. 1, with the above history. Upon examination of the tongue there was found an immense ulcer, which involved the center and right side of the tongue, almost its entire length; the posterior portion of the ulcer was bounded by an enlargement, probably the size of a small hickory-nut, which upon palpation was rather firm and consisted probably of the active proliferated portion of the neoplasm. The edges of the ulcer were undermined, inflamed and everted, and in spots showed active proliferation in the shape of small, well-defined tumor masses. The floor of the ulcer was covered with a dirty gray secretion, which was removed with some difficulty. Upon raising the undermined edges with a probe, one beheld the ulcer to be crater-like, involving almost the entire base of the tongue, and immediately brought to one's mind the possibility of an erosion of the ranine and lingual arteries, although from time to time he did have more or less profuse hemorrhage from the tongue. The lateral borders of the tongue and gums presented all the appearances of salivation, which was further evidenced by the copious flow of saliva. One also saw the remains of the extensive leukoplakia on the left side of the tongue. Upon manipulation by the thumb and first finger grasping the tongue, it was found to be quite firm throughout the main muscles of the tongue, namely, the geniohyoglossus.

The submaxillary lymphatics were but slightly palpable, while those anterior to the sterno-cleido-mastoid muscle, about its middle, were the size of a marble, and tender and painful upon palpation. Supraclavicular and axillary were not palpable. A section was immediately excised from the proliferated edge of the ulcer, and examined by Dr. Herzog, Dr. Hektoen, and myself, and all agreed that it was a rapidly proliferating flat-celled carcinoma.

Inasmuch as operation was refused, the treatment consisted in keeping the ulcer disinfected and overcoming the salivation and sustaining his strength, and relief of pain by means of anodynes. He died suddenly on the 12th of November. No post-mortem was allowed.

My object in reporting this last case is to emphasize the importance of Ribbert's theory, that there exists a certain relationship between the basement membrane and the overlying epithelial cells, which, if disturbed,

allows of the active proliferation of the overlying cells, and consequent invasion of the deeper structures to the point of malignancy. Also the importance of an early histologic diagnosis in these cases, and early radical operative interference, if we wish to lessen the mortality percentage of such cases.

70 State Street.

ON THE INFLUENCE OF HEREDITY IN TUBERCULOSIS.*

H. J. Achard, M.D.
CHICAGO.

It is a trite saying that an ounce of prevention is worth a pound of cure. The crusade against tuberculosis, which has in little over fifty years grown from practically nothing to a world-wide movement, has long been recognized to find its successful completion not so much in the cure of the tuberculous as in the prevention of tuberculosis. This is the real problem, and it is by no means made easier from the fact that the tuberculous infection, which constitutes the origin of adult consumption is, with great frequency, acquired during childhood if not already in infancy.

It is manifest that the tuberculous seed cannot grow except in an adapted soil, in a predisposed organism, and while an originally normal organism may become predisposed for definite reasons, such as disease, accidents, excesses, etc., thus giving to latent tubercle bacilli an opportunity to become active and produce disease, it is also possible for a predisposition to be inherited, being transmitted from parents to children, whether as a condition of insufficient resistance ("Minderwertigkeit") or as a hypersusceptibility to infection and its resulting disease.

Oliver Wendell Holmes once said that the proper time to begin a boy's education is a hundred years before he is born. It is not a *very* long time, and I venture to paraphrase Dr. Holmes' epigram by saying, the proper time to begin the treatment of tuberculosis is a hundred years before it commences: by preventing the development of a predisposition, of a soil favorable for the growth of the tubercle bacilli; for if we could eliminate from the human and animal species the predisposition, the susceptibility to the pathogenic action of the tubercle bacilli, an infection with these bacilli would not develop into tuberculous disease. When this problem is solved we shall have solved the problem of the Great White Plague.

Gentlemen, the subject of heredity, once all important in its relation to disease, appears, since the beginning of the bacteriologic era, to have retained only an academic interest. In the meaning and influence which I will attempt to outline it assumes an eminently practical importance.

The idea that there are diseases which are transmitted by heredity is as old as medical observation and medical thought. It offers a ready, and not unacceptable explanation of the threat pronounced in the Old

* Read in a Symposium on Heredity before the Chicago Medical Society, May 4, 1910.

Testament that the sins, which means the imperfections or errors of the parents, shall be visited on the children unto the third and fourth generation. This curse is made terribly true, e. g., in the case of syphilis.

It is not astonishing, even to our present mode of thinking, that tuberculosis, or rather the form of the disease which was known to the ancients, i. e., consumption, should have been classed among the hereditary diseases. From Hippocrates, whose Latin translator wrote the epigrammatic *phthisicus a phthisico natus est*, down through the middle ages and to modern times it appeared to be a self-evident fact that "tuberculosis runs in families" and what more natural than to explain this by calling the disease inherited. According to Sylvius[1] it is shown by frequent experience that entire families are inclined to phthisis, so that but few of their members escape the affection, and according to Richard Morton[2] it was well known to everybody that the children of phthisical parents are inclined to the same disease. Portal, Hufeland, Laennec, Schoenlein, Benjamin Rush and most great clinicians of the last century asserted the hereditary transmission of phthisis to be the most frequent cause of the disease, so that "There was perhaps no fact of experience regarded as so incontrovertible as the heredity of tuberculosis. Every day the physician sees tuberculosis reap its harvest among the progeny of a tuberculous father or a phthisical mother. He sees the children of such parents grow up scrofulous in childhood, and perish tuberculous in youth."[3]

Nevertheless the assertion of the hereditary nature of phthisis has for a long time had its opponents, and especially Villemin,[4] who in 1864 showed tuberculosis to be an infectious disease, objected to the theory of its hereditary transmission very emphatically. Virchow[5] had declared in 1864-5 that tuberculosis is transmitted not as the actual but as the potential disease, the predisposition to it being passed on. Louis[6] had, in 1825, given but very lukewarm support to the theory of the heredity of phthisis by saying that about 10 per cent. of his consumptive patients had had parents die of the disease, but that they might just as well have acquired it in some other manner than by heredity, so that he had after all not observed any definite proof of the heredity of phthisis.

If during the first half of the nineteenth century under the stimulation of exact pathologic research, aided by the microscope introduced into pathologic investigation by Gluge, the old prevailing opinion of the actual transmission of tuberculous disease had given way to the idea that heredity was active more in creating a predisposition, even this eventually became severely shaken by the strict bacteriologic school and is to-day denied outright by many investigators. According to Virchow:

Tuberculosis is essentially a disease of extrauterine life, and if it is hereditary, which cannot be doubted, it is not congenital. It is not hereditary as disease but as predisposition. And at the Berlin Tuberculosis Conference in 1899 he said:

1. Sylvius, Franciscus Deleboe: Opera Medica, 1695, Tractatus iv; "De Phthisi."
2. Morton, Richard: Phthisiologia, Francofurti et Lipsiæ, 1691.
3. von Ziemssen: Wood's Med. and Surg. Monographs, New York, 1889, iii.
4. Villemin: Etudes sur la Tuberculose, Paris, 1868.
5. Virchow: Die krankhaften Geschwuelste, Berlin, 1864-65, ii.
6. Louis: La Phthisie pulmonaire, Paris, 1825; 1843, Ed. 2.

Until recently one dogma was considered as almost incontrovertible, i. e., the dogma of a congenital hereditary tuberculosis. This is a spook which haunts the human mind in many ways. I deny positively the heredity of tuberculosis. The bodies of new-born infants, which have not lived outside of the maternal womb, are not tuberculous. I am convinced that everything which in the new-born looked like tubercle was not tubercle. In my opinion in not a single authenticated case has tuberculosis been found on autopsy of a new-born infant.

Cohnheim,[7] who, as you know, at first denied the correctness of Villemin's demonstration that tuberculosis is an infectious disease, and later became a pronounced contagionist, said in his well known pamphlet on Tuberculosis from the Standpoint of Infection:

I do not deny that tuberculosis can be inherited, but such an inheritance is probably a rare occurrence, and entirely unimportant etiologically as compared with extra-uterine infection.

With Villemin's, and still more with Koch's demonstration of the infectious nature of tuberculosis its hereditary transmission became as a matter of course more than questionable. Although Koch[8] at first admitted that certain peculiarities may be transmitted which favor the development of germs introduced later into the body, the intra-uterine transmission of an actual tuberculous disease was to him the more problematical as his experiment animals which frequently became pregnant before as well as after infection, never had litters of young which were tuberculous before birth. Even the young of highly tuberculous mother animals were free from tuberculosis at birth and remained healthy for months.

In more recent years with the studies of Weismann,[9] of Martius,[10] and others, the direct hereditary transmission of tuberculosis, as of all disease *per se,* has been definitely disproved, although many French authors, notably Lannelongue, Landouzy, etc., insist upon the importance of hereditary influences, as do the Drs. Williams, e. g., in England, Austin Flint and Reginald H. Fitz, and others, in this country. In Germany, Baumgarten and his pupils stand practically alone in the assertion that tuberculosis is principally transmitted by heredity, and in Baumgarten's case it is a matter of mistaken terminology.

Before proceeding in the discussion of my subject, permit me to determine clearly just what is meant by the terms which I am using.

Disease according to the Standard Dictionary, is any departure from, failure in, or perversion of normal physiologic action in the material constitution or functional integrity of the living organism: a morbid condition resulting from such disturbance, or failure of physiologic functions.

After Orth's[11] definition disease is a process, a vital process, but one deviating from the normal. *Disease is life under abnormal conditions and with abnormal aspects.* The external cause of a disease (e. g., para-

7. Cohnheim: Die Tuberkulose vom Standpunkte der Infektionslehre, Pamphl., Leipzig, 1881; 1882, Ed. 2.
8. Koch, R.: Mittellungen a. d. kais. Gesundheitsamt., Berlin, 1884, Bd. 2.
9. Weismann: Vortraege ueber Deszendenzlehre, Jena, 1902, cf.
10. Martius: Pathogenese Innerer Krankheiten, Wien., 1909.
11. Orth: In Senator-Kaminer, Marriage and Disease, transl. by Dulberg, New York, 1909.

sites) may be present; there may be an infection, but an infectious disease as a consequence of that infection does not begin until the parasites occasion disorder in the vital processes. It is absolutely necessary to distinguish between cause of disease and disease itself. A man may harbor in his mouth virulent diphtheria microbes without being ill; he has no diphtheria, although he carries about with him the cause of diphtheria, and can make others diphtheric by conveying to them the causative agents.

A contagious disease (*contingo*, to touch, come in contact) is one which is transmitted from one person to another by direct contact, while an infectious disease is one produced through the entrance into the body, and virulent action of, an infectious, i. e. pathogenic virus. *Infection* itself is, however, not the infectious disease (*in-ficio*, to contaminate); it is only the communication of the disease-germ and it is wrongly used in a synonymous sense with the resulting disease. We may be infected without being diseased, and since Straus, in the eighties, found virulent tubercle bacilli in the nasal secretions of healthy students in the wards of Paris hospitals, similar findings have frequently been reported. We all carry staphylococci and streptococci on our mucous membranes although we are not ill with septic disease. Diphtheria and typhoid bacillus carriers are no longer ill with diphtheria or typhoid although they are infected.

Since Gaub taught, in 1758, that pathogenic agents cannot by themselves be accused as the sole causes of disease but that the predisposition of the body must be considered as a deciding factor, much has been said and written concerning the importance of a predisposition to disease. While some writers claim that without predisposition there can be no disease, at least no infectious disease, since an infectious virus may be virulent for one and not for another individual [because it finds in the former a favorable soil, in the latter fails to find it]; others, especially in the first years of bacteriologic research refused to admit a predisposition at all.

So said Cohnheim in 1881: "According to our present views everybody in whose organism the tuberculous virus is introduced becomes tuberculous." Later, predisposition was taken to mean merely a negative resistance and is so understood to-day by many writers, but in more recent years predisposition has been recognized not as a negative quantity, but as an active condition of the organism by virtue of which an infection leads to an infectious disease. This has been recently elucidated especially by Wieland,[12] and by Schlueter[13] in his excellent monograph, of which, to my surprise, no English translation has as yet been published as far as I know.

Experience decidedly forces us to assume that the perfectly healthy human organism is resistant against the permanent colonization of tubercle bacilli and that their efficient reception in the lungs, intestines, etc., only occurs when certain conditions are present which favor their colonization and multiplication. This unknown pathogenic something

12. Wieland: Beiheft z. Med. Klinik, 1908, No. 4.
13. Schlueter: Die Anlage zur Tuberkulose, Wien, 1905.

we call predisposition to tuberculosis, applying this term to a certain constitution of the tissues pathogenic of the organism. We cannot do without this predisposition says v. Ziemssen, which may be acquired as well as congenital. It exists with regard to other infectious diseases, such as typhoid fever, cholera, dysentery, etc.; why should we not also assume a predisposition for the action of the tubercle bacilli?

The principal factors in this connection are the bodily conditions, the peculiarities of the build, of the chemical composition, and of the activity of the organic tissues, and the qualities of the individual constitution.

The human body is not without protection at the mercy of external causes of disease, and particularly of parasites; on the contrary it possesses a large number of protective agencies, which being to a great extent regulating arrangements, enable it to offer resistance to abnormal conditions of life and to external causes of disease, the tendency of which is to generate disorders in the vital process, viz: to produce disease; they enable it to render those causes abortive, and thereby maintain the normal course of the process of life. Everything which prevents that regulation from taking place, every incapacity of the body to resist external causes of disease, therefore every peculiarity of the constitution which renders the latter unable in the struggle of the body with the causes of disease to maintain the normal course of the vital phenomena, every such peculiarity of the constitution may be designated as a tendency, as a predisposition to disease.

There are individual predispositions to disease, which we designate as family predispositions when the same special peculiarities of constitution appear in several members of one and the same family. Of course not all individual peculiarities of body, not all family peculiarities of body, are predispositions to disease; they are so only in so far as they do not prevent the production of disease, or in so far as they tend to favor it.

How can the influence of heredity be exerted upon a predisposition? Ruehle[14] said:

> The general conditions which contribute to the causation of phthisis are the so-called constitutional anomalies which in many cases have manifested themselves from childhood in the form of scrofula, or exist as an inherited or congenital taint without having disclosed themselves by symptoms.
>
> How this inherited diathesis is produced, or what is its real nature, are questions beyond our present knowledge. But if the external form of the body, and mental qualities can be transmitted in families through generations, why should this not be the case also with the conditions which produce a disposition to certain diseases? Our only resort is to the concurrent testimony of all times, and this is so strong that no physician who makes an unbiased examination can reject it. Whole families have been destroyed by phthisis. The inherited influence may of course manifest itself in various ways: Sometimes in the form of a general deviation from ideal health, a "delicacy of constitution:" at other times in the form of a particular local affection of the thorax and its viscera. These manifestations may not be marked at birth or in early childhood, but only become evident in later years, especially at the time of more rapid growth.

14. Ruehle in von Ziemssen, Cyclopedia of the Practice of Medicine, Am. Ed., New York, 1875, v.

In my opinion the inheritability of phthisis is a very important factor. I regard phthisis as belonging in a high degree to those diseases which are in some way dependent upon an inherited tendency.

It has been productive of much confusion that the bare fact of a tuberculous family history was considered sufficient evidence of a tuberculous heredity. It has long been pointed out by such men as Broussais, Louis, Straus, Cornet and others that the parental disease often occurred years after the patient's birth. Since the infectious nature of tuberculosis is understood, the importance of extra-uterine infection by contact with tuberculous parents has been paid proper attention, and evidence was looked for of infants or of the young of animals, or then of fetus of both, which showed lesions of tuberculosis in their organs. And yet even such, as we shall see presently, cannot be called inherited any more than an infant which at birth shows signs of intra-uterine smallpox is said to have inherited smallpox. We rather say that the disease was acquired by intra-uterine infection, and the lesions present at birth while congenital, are not inherited.

There are general biologic reasons why we should not consider as hereditary all that is derived from the mother during intra-uterine life. In the amphigonous propagation of the species the value of the male germ is for hereditary purposes equal to that of the female, for we see, to cite Orth, how anxiously, if we may use such a term, Nature looks to it that at the fecundation of the ovum the future being shall receive just as much chromatin from the paternal as from the maternal germ; i. e. that from father and from mother the same amount of hereditary substance is transmitted. It follows therefore that the hereditary transmission of such qualities or possibilities only is possible as are inherent in the germinative plasma of both parents. This does by no means limit the hereditary possibilities to those derived from the parents. These themselves have either actually or potentially the possibilities inherited from their parents who in turn have received them from their parents, and, as Lorenz (cited after Schlueter) points out very correctly since in considering the inherited possibilities we must take into account not only the paternal, but in like degree the maternal ancestors whose determinants are active or dormant in the parental germ cells, it is evident that at a successful copulation an enormous amount of hereditary substance may be drawn from, and that any set of determinants may become activated in a given case. Thus, for instance, the arrival of a red-headed child in a family where all sisters and brothers as well as parents and grandparents, uncles and aunts are of dark complexion may find its explanation in a red-headed ancestor many generations removed.

The entire hereditary substance is materially and virtually contained in the two germinative parental cells which unite after the fruitful copulation, and once these cells have so united the act of inheritance and the influence of heredity is completed. Whatever influences may affect the fetus *after* this union of the paternal and maternal germ cell, is acquired and may produce congenital peculiarities, but these are not inherited. In such an acquirement the mother plays of course the more important rôle, for it is doubtful whether the father can exert any con-

siderable influence upon the growing fetus, while this is intimately connected with the maternal organism through the placenta.

Nobody will even dream of doubting or denying that structural and physical, as well as mental peculiarities can be inherited, that heredity is not limited to a transmission of the anatomical characteristics of the species. The large lower lip of the Hapsburgs, the hooked nose of the Bourbons are a matter of history, and Anthony Hope has, perhaps, unconsciously, made use of this fact in his *"Prisoner of Zenda,"* when he endowed the hero of his story with the red poll and other characteristics of an interloping ancestor of his family. Orth cites Devay's account of the inhabitants of Eycaux, a little isolated village in the Pyrenées (Isère, France) who at the end of the eighteenth century almost all possessed six-fingered hands and six-toed feet. The transmission of this peculiarity was encouraged by the constant intermarrying, unavoidable on acccount of the isolation of Eycaux. Later when new and strange blood was introduced the anomaly disappeared.

In like manner are mental characteristics frequently transmitted directly from parent to offspring, although it is unfortunately too true that unusually brilliant parents often beget decidedly mediocre children. In consanguineous marriages, especially if these recur through many generations the variability of the hereditary substance is comparatively limited and in such cases structural anomalies, such as cleft palate, hare lip, spina bifida and mental traits are often transmitted. Orth explains the fact that the offspring of blood relations are frequently mentally deficient, thus that such mental deficiencies are already present in the parents and that these are responsible for the incest.

The words *inherited* and *congenital* are often used synonymously, but without justification, because as is evident from our consideration, although everything inherited is also congenital, it does not necessarily follow that everything congenital is also inherited. The opposite of *inherited* is *acquired* and this may be intra- or extra-uterine acquirement; anything acquired intra uterum is congenital but not inherited.

All that is present in or about an individual at the time of his or her birth is congenital. Congenital peculiarities need not be recognizable in the new-born infant but may be latent, just as inherited traits may be latent (e. g., the characteristics of puberty). The same may be true for disease. While syphilis, for instance, may be clinically present at birth (congenital) we also recognize a late congenital syphilis which need not become manifest for years.

Now what among the congenital phenomena is to be considered inherited? Surely not that which has occurred in consequence of disease in the fetus, for what the fetus receives from the mother in the course of its development is congenital but not inherited. If a mother transmits at any time some acute infectious disease to her child, nobody ever thinks of applying the word *inherited* even if this transmission occurs before the birth of the child. Whatever passes to the fetus by way of the placenta is as much acquired as that which is transmitted to the nursling through the mother's milk.

Since the influence of heredity ceases with the union of the parental germinative cells, the hereditary transmission of a disease could only take place if the germ-cells were diseased, in the disease under consideration, if they were tuberculous. Although tubercle, the anatomical characteristic of tuberculosis is very minute, it is difficult to conceive of a tuberculous spermatozoon, and we can hardly more readily imagine a tuberculous and yet viable ovulum. The contingency of a tuberculous ovulum being actually fructified, or of a healthy ovulum being fructified by a tuberculous spermatozoon is not likely to occur in fact, seeing how improbable it is that diseased germ cells could develop into a viable embryo. and if either ovum or spermatozoon were simply carriers of tubercle bacilli without being tuberculous they would not *in primis* transmit the disease but only the cause of the disease, they would carry infection from which congenital disease might develop. But even if a spermatozoon carrying tubercle bacilli were to be discharged during intercourse it is very unlikely that among the many millions just this one should become the paternal germ cell of the coming embryo; in fact Simmonds[15] has reported two cases of men with testicular tuberculosis who procreated healthy children, in whom at the age of 9 to 24 months, respectively, tuberculous disease had not become discernible, and in the animal experiments of Gaertner and others it required enormous amounts of tubercle bacilli to obtain positive results.

Quite aside from the leading theory that diseases as such are not transmitted by heredity, we see how impossible it is that out of tuberculous germ cells, a viable embryo could develop, and if it did develop, that it would remain viable to term, or if born that it could survive the vicissitudes of infancy long enough to be a monument of an actually inherited tuberculosis. When it therefore happens, as it undoubtedly does, that an infant is born with evidences of tuberculosis, or, as is probably more often the case, with tubercle bacilli somewhere in its organs, especially in the hepatic hilus glands, but without pathologic evidences of tuberculosis, these tubercle bacilli are not derived from the father, but are carried from the maternal to the fetal circulation either intra uterum and ante partum, or then during labor.

We know, however, that tuberculosis is ordinarily not a bacillemia. The latest attempt to demonstrate the contrary has been sufficiently disproved. Excepting miliary tuberculosis only in the acute forms and in far advanced chronic phthisis, practically in the agonal or pre-agonal period, do the tubercle bacilli enter the blood without being destroyed or deposited in lymph glands, and post-mortem records show that the few infants on record who have been born with congenital tuberculous lesions came of consumptive mothers who invariably died within a few weeks after labor.

You are aware that Baumgarten claims an intra-uterine transmission of tubercle bacilli which are held latent on account of the vital energy being greater in the growing infant and child than in later life. It has

15. Simmonds. Deutsch. Arch. f. klin. Med., 1880, xxvii, cited after Cornet, Die Tuberculose, 1899, p. 242.

been shown by many investigators and clinicians that the young of all species which are subject to tuberculosis are highly susceptible to the action of tubercle bacilli and quite incapable of offering the slightest resistance. From the statistics of Papavoine (cited by Louis, l. c.) and those of Rilliet and Barthez[16] (1845) down to those of to-day it appears that during the first six or nine months of life the mortality from tuberculosis is 100 per cent., after which it slowly falls to about 50 per cent. at the age of ten to twelve. Again, newborn animals, if infected with tubercle bacilli, succumb far more promptly than do older animals. Thus it appears extremely unlikely that the principal mode in which tuberculosis is acquired is by intra-uterine infection as Baumgarten has it. The fact that infants and children of consumptive parents frequently succumb to the disease is due to extra-uterine infection and to unfavorable environment. This is fully borne out by the experience in orphan asylums. Bollinger reported some years ago that in the orphanage in Munich in a number of years not a single case of tuberculosis had occurred among the pupils, although these came from highly tuberculized environments. Stich[17] claimed to have seen only one case in Nuremberg in the course of eight years. An inquiry made in Paris among the *Enfants Assistés* (cited after Straus[18]) elicited a surprisingly small per cent. of tuberculous children when these were removed from their consumptive parents early enough. Bernheim's well known experience amounts to a human experiment and will bear repetition in this connection.

Bernheim prevailed on the consumptive mothers of three sets of twins, to send one each of their babies to the country, keeping the other one at home. The three infants who were thus removed from the danger of infection throve and grew up well, while the children who had remained with their mothers all developed tuberculosis, and died of the disease.

But if tuberculosis is not transmitted as a disease, and is acquired only exceptionally in the uterus, it is otherwise with the predisposition.

Matthew Baillie, Portal, Hufeland and many others who spoke of scrofulous phthisis looked upon scrofula as leading to the wasting disease. Richard Morton already had called scrofula one of the most frequent causes of accidental, i. e., not directly hereditary, consumption. Early in the nineteenth century when the hereditary transmission of a predisposition was assumed more and more instead of the transmission of the disease, this predisposition was found in constitutional weaknesses of all kinds, foremost among which was scrofula, and this opinion was upheld even after the discovery of the tubercle bacilli, e. g., by Rindfleisch, Ziegler and quite recently by Orth, while other authors, notably Baumgarten, denied this predisposing rôle of scrofula, claiming that it was itself already tuberculosis.

16. Rilliet et Barthez: Traité des mal. de l'Enfance, Paris, 1845; Ed. 3, 1893.
17. Stich: Deutsch. Arch. f. klin. Med., 1888, xlii; Cited after Cornet, Tuberculosis in Nothnagel's Enc. of Pract. Med., Am. Ed., 1904.
18. Straus: La Tuberculose et son Bacille, Paris, 1895.

In like manner the phthisical habitus which was so graphically described by Aretæus as peculiar to those inclined to hemoptysis and by other authors as characteristic of candidates for consumption was claimed to be inherited because often congenital, and was asserted to be a cause of phthisis. Other authors, however, insisted that it was not a cause but an effect of the disease. Virchow spoke of a vulnerability of tissue in those predisposed to tuberculosis which he, however, did not define. Since 1882 the many studies on tuberculosis in all directions were also applied to predisposition and Freund especially took up his earlier (1858-9) investigations concerning the paralytic thorax, showing that a congenital narrow upper thorax aperture produced a predisposition to tuberculosis by inhibiting proper respiration and therefore efficient aeration of the apices. The well known studies of Birch-Hirschfeld concerning the anatomy of the apical bronchi, Schmorl's determination of a pressure groove on the upper and posterior aspect of the apex, Rothschild's explanation of the Angulus Ludovici, Woods Hutchinson's researches on the chest index, etc., all belong here but cannot be discussed for lack of time. It has even been claimed that a locus minoris resistentiæ is transmitted, that is, that the tuberculosis in a hereditarily predisposed subject develops in the same organ, on the same side, and even in the same portion of the organ as that affected in the parent.

The clinicians of old have always insisted that not only the children of consumptives are hereditarily inclined to phthisis, but also children of persons afflicted with cancer, with syphilis, lead poisoning, alcoholism and with any wasting disease, likewise the children of very old and very young parents, etc. Just as everything affecting a person's health has at one or another time been classed as a cause of phthisis, so everything has been said to be capable of producing a predisposition. It appears then that such a predisposition if due to parental debility from other causes than tuberculosis could not be specific. However, opinions are not wanting to the effect that the predisposition to succumb to the action of the tubercle bacillus is specific. Courmont elaborated a number of years ago a rather striking hypothesis, on which he published many communications, and which was warmly supported by Arloing and appears to find support in the investigations of the last years on what Richet calls anaphylaxis, and which von Behring had long before him described as hypersensitiveness.

Courmont said that the specific toxins and soluble products of tubercle bacilli which form in tuberculous foci pass into the circulation and are, in the case of tuberculous pregnant women carried to the placenta, whence they are taken up by the fetal circulation. The fetus is then in the same condition as is an experimental animal inoculated with filtered cultures and offering a favorable soil for the first bacilli that invade its organism. Rosenau and Anderson[19] demonstrated conclusively that the condition of anaphylaxis is transmitted by heredity and thus proved the possibility that a morbid disposition in the sense of an altered resistance, the allergie of v. Pirquet, may be transmitted from parent to offspring.

19. Rosenau and Anderson: Hyg. Lab. Bull. 29, U. S. P. H. and M.-H. Service.

They said: "Now that we have proved that this hypersusceptibility of anaphylactic action in the case of horse-serum may be transmitted hereditarily in guinea-pigs, may it not throw light upon the fact that tuberculosis runs in families?"

In spite of the fact that many consumptive parents have healthy offspring who never contract tuberculosis, and reversely that many children and adults become tuberculous whose parents never were so affected, it appears at least reasonable to suppose that the presence of debilitating diseases in the parents influences the natural resistance of the offspring to any infection adversely. We must also admit, after the researches of Courmont, Rosenau and Anderson, etc., which have been verified by other experimenters that a condition of hypersusceptibility may be transmitted which then is specific.

But the question presents still another aspect. Epidemiologic studies have long since shown the immunity enjoyed by certain persons to infections to be due to prior infection or intoxication with the particular germs or their toxins, or then to such a prior infection in the parents from whom the immunity was transmitted to the children. In this manner the fact is explained that many diseases which centuries ago destroyed their tens of thousands now are comparatively harmless; it also explains for instance the relative immunity of the Jewish race to tuberculosis. Rindfleisch claimed many years ago that nations which are subject to epidemics, in course of time become accustomed to them and more or less immune. Reibmayr[20] claims in a very interesting monograph that tuberculosis is undoubtedly transmitted by heredity, but that at the same time a degree of resistance or immunity is transmitted, and that the more thoroughly a race is in this manner permeated with tuberculosis the sooner it can work out its salvation from the ravages of the disease.

Effertz[21] has observed among the Central American Indians that syphilis never occurs in its primary or secondary manifestations and is an exceedingly mild disease, while the natives are entirely non-resistant to tuberculosis. He argues that syphilis has existed among them for so long that they have acquired a considerable degree of immunity, which derives support from the fact that whites contracted the disease in virulent form from native women who showed no symptoms whatever. On the other hand, since tuberculosis was brought to the Indians only with the Caucasion invasion they have not yet become sufficiently permeated with the disease to have acquired an immunity.

For some time various observers have come to the conclusion that, the existence of hereditary predisposition being granted, this factor need not necessarily darken the chances for a cure, and that indeed, it might even be a favorable factor in the prognosis. Flick[22] is one of those who deny the influence of heredity from a prognostic standpoint and believe in a transmitted partial immunity. Weicker[22] recalls that Meissen was the first one thus to point out that patients with hereditary pre-

20. Reibmayr: Die Ehe Tuberkuloeser und ihre Folgen, Wien.
21. Effertz: Wien. klin. Wchnschr., 1904.
22. Cited after Karl von Ruck, Am. Jour. Med. Sc., August, 1907.

disposition are not at a disadvantage in point of the improvement aimed at, as compared with those without hereditary predisposition. This view is also supported by Turban and by Rumpf.

Dr. Karl von Ruck collected, in 1907, the literature on the question and supplemented it from statistics of the Winyah Sanitarium. He found that of 1,327 patients discharged as cured or improved, 434 or 32.63 per cent. had given a history of ancestral tuberculosis, while such a history was elicited in 47 out of 187, or 25.13 per cent. patients who failed to improve or grew worse, so that we find a difference of 7.5 per cent. in favor of an hereditary influence from a prognostic standpoint.

Gentlemen, the subject under consideration is too large to be handled in a short paper. For the sake of covering many phases I was obliged to present these somewhat disconnectedly and to leave out details and many important points. I have not considered the information to be gained from statistics at all, and also had to omit the results of comparative tuberculin and serum tests in newborn infants and their mothers. These questions I hope to discuss in a later communication.

My studies on the influence of heredity in tuberculosis suggest the following conclusions:

1. Tuberculosis as a disease is never inherited.

2. A general and a specific predisposition (hypersusceptibility) may be transmitted; whether an actual tuberculosis develops on this foundation depends upon an exposure to infection. The transmitted predisposition is probably modified by a degree of specific resistance, which may likewise be transmitted.

3. Congenital tuberculosis is exceedingly rare and can therefore not be admitted as the principal cause of phthisis in adolescence or adult life.

4. Congenital tuberculosis is not a hereditary disease but is due to intra-uterine infection by way of the placenta. It is only possible when the placenta is pathologically altered.

5. Congenital tuberculosis is observed only in the infants of women with far advanced phthisis, the mothers in all cases on record having died soon after delivery.

6. Infants with congenital tuberculosis succumb always to the disease in the first weeks or at most months of extra-uterine life.

100 State Street.

TUBERCULOSIS OF THE EAR, THROAT AND NOSE.*

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SPRINGFIELD, ILL.

Tuberculosis of the lungs was described by Hippocrates,[1] B.C. 460. He also alludes to "ulcers in the tube of the lungs." Probably this was the first description of tuberculosis of the larnyx. In 1829 Albers[2] gave

* Read at the Sixtieth Annual Meeting of the Illinois State Medical Society, held at Danville, May 17-19, 1910.

1. Lockard: Tuber. of Nose and Throat, 1909.
2. Die Pathol. u. Therap. der Kehlkopfkrank., Leipzic, 1829.

a description of the clinical appearance of tubercles in laryngeal phthisis, and the transformation of these into ulcers. In 1856 Wunderlich[3] called attention to the comparatively frequent appearance of tuberculosis in the larynx and lung diseases of long standing, when accompanied by colossal secretion. In 1860 Gerhart[4] reported a series of cases in which he clearly described syphilis, and differentiated it from tuberculosis by means of the laryngoscope, which was made practical in 1855 by Garcia.[5] In 1879 Oscar Heinze[6] demonstrated that ulceration in the larynx and trachea never leave tuberculosis, unless there is a simultaneous or subsequent tuberculosis of the mucous-membrane. In 1882 Koch demonstrated the tubercle bacillus, and presented evidence to show its etiologic relation to tuberculosis in man. Both before and since this time the recognition of many cases of tubercular laryngitis, and the reporting of the same as primary and secondary disease, has filled medical literature with a voluminous bibliography on this subject, to detail which is not the object of this paper. In comparison, the volume of literature on tuberculosis of the ear, nose, and accessory sinuses is very meager.

Lockard[7] in 1909 collected the data on 3,366 cases of tuberculosis, in which there were seventeen cases of nasal tuberculosis. He states that of the accessory sinuses, in so far as reliable statistics are available, the maxillary has been tuberculous twenty-two times; the frontal cells in four cases, and the ethmoidal and the sphenoidal combined in two cases.

In February, 1907, Fein[8] describes a case of tuberculosis of the nasal mucosa, which was probably primary tuberculosis in one turbinated bone, and states that he knows of only one case besides this one, on record.

In August, 1907, Gleitsmann[9] states that tuberculosis of the accessory sinuses is of rare occurence. He says further, that the majority of cases seem to be due to extension from a neighboring focus. He reports twenty cases, twelve of which were of maxillary involvement.

August 17, 1909, Thrasher[10] reports a case of primary nasal tuberculosis in a girl aged fifteen years.

In September, 1907, Shoemaker[11] reports a case of tuberculosis involving the nose, with destruction of the deeper tissue. Dr. Ravogli stated that he had seen two similar cases.

In October, 1908, Mosher[12] states that owing to the protective power of the nasal mucous-membrane, primary tuberculosis of the nose is rare. Secondary tuberculosis of the nose is more common than primary.

The literature on tuberculosis of the ear would indicate that this disease is more prevalent here than in the nose and accessory sinuses. In October, 1906, Crockett[13] reported six cases.

3. Handbuch d. Spec. Path. u. Ther., Stuttgart, 1856.
4. Ueber Syphil. Krankheit. d. Kehlkopfes, Virchow's Arch., xxi, 1860.
5. Physiol. Observ. on Human Voice.
6. D. Kehlkopfschwindsucht, Leipsic.
7. Lockard: l. c., p. 269.
8. Jour. Am. Med. Assn., Feb. 2, 1907, p. 461.
9. Cited by Jour. Am. Med. Assn., Aug. 3, 1907, p. 419, from Laryngoscope.
10. The Lancet-Clinic, Cincinnati, Aug. 17, 1907.
11. Jour. Am. Med. Assn., Sept. 14, 1907, p. 942.
12. Jour. Am. Med. Assn., Oct. 17, 1908, p. 1364.
13. Jour. Am. Med. Assn., Oct. 20, 1906, p. 1293.

Tyerson states that the disease is rare, but is often secondary to pulmonary tuberculosis. In 1907 Harland,[14] speaks of three operations for tuberculosis of the ear. In October, 1908, Blake[15] of Boston, speaks of the clinical aspect of tuberculous infection of the ear, and states that disease is characterized by a considerable and rapid destruction of all tissues, which is coupled with a lack of preliminary subjective symptoms. Reik[16] stated that tubercular suppuration of the middle-ear is not so dangerous as suppuration due to pyogenic organisms.

Although our study of the literature on this subject has not been exhaustive, it is obvious to us that the reports of these cases are very few in proportion to the occurrences of the disease, and the literature is very meager in comparison with the literature on tuberculosis in other parts of the body.

In general, tubercular infections occur in any part of the body in one of three ways. Infective material is deposited on the mucous surface of the air passage, or the intestinal tract at the same time of inhalation of tubercular contaminated air, or at the time of ingestion of tubercular infected food, or at the time of excretion of tubercular bearing secretions. Again tissue may become involved in any part of the body secondarily as a result of the extension of the tubercular process over contiguous tissues, and lastly, a tubercular process may be set up in a tissue when the resistance of that tissue is low after the tubercle bacilli are brought to and deposited in the tissue by way of the circulating blood, or circulating lymph.

Once the tubercle bacilli have been deposited in the tissue, the resistance of which has been lowered either by local or general causes, then the process of tubercular degeneration begins; the multiplication of bacteria, the releasing of endo-toxins, and the formation of toxic products from the disintegration of tissue cells.

The effort of nature to antagonize the process and repair the damage, results in induration, giant cell formation, scarification, and calcification. These are the pathologic changes which our histologic study of these lesions shows. Inasmuch as the development of other organisms in the tissue give rise to similar pathologic changes and similar clinical pictures, neither the pathology nor the clinical picture can lead us to a positive diagnosis of these cases when one has not found the tubercle bacilli.

In our observations on this subject the actual demonstration of the presence of the tubercle bacilli has been in every case the basis of our diagnosis. The description of clinical symptoms of our cases wherever we will detail them, will be given to call attention to the lack of uniformity in the clinical aspect of these classes of cases.

We wish to report thirty-six positive cases of tuberculosis, the diagnosis of which was made from the microscopic examinations of excretions from infected tissue. These cases have no value in a comparative

14. Quoted from Laryngoscope, January, 1907, in Jour. Am. Med. Assn., Nov. 16, 1907, p. 977.
15. Jour. Am. Med. Assn., Oct. 10, 1908, p. 1256.
16. Jour. Am. Med. Assn., Oct. 10, 1908, p. 1256.

statistical way because all cases coming to the David Prince Sanitarium during the past twelve months while we were making these observations were not examined microscopically.

The procedure adopted by us in our routine examination is not difficult. It must have been necessarily simple, as in routine practice one cannot keep the cases under observation for any length of time; also a large per cent. of the cases came from other towns and, therefore, we had only the one chance of making an examination.

Our procedure was as follows: Inspection of the sinuses was made; pus and excretion was secured from the various atria of discharge. These specimens were examined for tubercle bacilli by a modified method of Zihl-Neilson, recommended by Charles E. Mix, Chicago, Ill., viz.: The material was smeared on slides, fixed with heat, stained for three minutes with carbol-fuchsin, washed, decolorized in 10 per cent. sulphuric acid, again washed and counter-stained with picric-acid, and *dried with a blotter.* This preparation has many advantages over the methylene-blue counter-stain.

There is nothing in the field that has a stain except the tubercle bacilli. We, therefore, can study our specimens much more rapidly.

The lighter color of the back-ground makes it practical to prepare very thick smears, hence, each field we pass over contains a much larger amount of material than when stained with methylene-blue. When methylene-blue is used as a counter-stain there is a deep staining of the nucleus of the pus cells, which obscures any tubercle bacilli beneath the pus cells, or within the cell near the nucleus. We have, thus, been able to determine the presence of the tubercle bacillus often when it might otherwise have been overlooked.

There is a variety of tubercle bacilli which we have noticed in which only the granular portions are brought out with the acid-fast stain. The bodies of the organisms take the blue stain, therefore the granular portions which are red are indistinct, and often not observed. With the picric-acid oftentimes these granular forms have been numerous, and have at once attracted our attention, so that a continued search demonstrated the presence of typical tubercle bacilli.

The frequent finding of tubercle bacilli in the excretion from the sinuses and tonsils, influenced us to adopt with enthusiasm Rosenberger's[17] demonstration of the bacillus in the circulating blood. In a number of cases his method was tried and the acid fast organisms demonstrated, even when we were not able to find them in the secretions. In view of the doubt thrown on Rosenberger's method we found it necessary to discard this as a routine procedure.

The technic in the examination of the tonsils was accomplished by making a half dozen or more complete sections of the tonsil, placing over the fresh cut surface a slide and examining carefully for areas of caseation. When these were located the material was removed with a platinum wire, and examined by above method. When no such areas were

17. Am. Jour. Med. Sc., February, 1909.

found material was scraped with the edge of a slide from the cut surface and an examination of this was made.

In cases of laryngitis, the diagnosis was made from finding the positive tubercle bacilli in the sputum.

For convenience in description we have collected the cases as follows: Tubercular laryngitis, four; tuberculosis of the tonsil, nine; of the middle-ear without mastoid symptoms, ten; mastoids, five; of the nose, three; of the frontal sinus, two; of the maxillary antrum, one; of the soft palate, one; of the ethmoidal sinus, two.

Tubercular Laryngitis.

1. C. B. L., plasterer, aged 25 years. Had hoarseness and cough. Examination November 10, 1909, showed swollen ulcerated larynx. Tubercle bacilli in sputum. Consolidation in right lung at the apex.

2. A. B. C., clerk, had been losing weight for some time. Had a slight cough, had had hemorrhages. Lung findings were negative. The patient suddenly became hoarse and noticing the irritation, soon after consulted us. There was a swollen ulcerated condition of the larynx. Tubercle bacilli were present in the sputum. Member of family had tuberculosis.

3. Mrs. J. W., housewife, aged 36 years. Four days after confinement, Nov. 15, 1909, had severe tonsillitis with temperature, and considerable inflammation of the throat. This was accompanied by a profuse secretion. The patient was very hysterical, and the tonsillitis was credited with inflammatory condition of the larynx. The lung findings were doubtful. Tubercular laryngitis was overlooked until an examination of the sputum showed the presence of tubercle bacilli. The condition failed to subside. Later the pulmonary involvement became marked. The patient died eight weeks after the diagnosis was made.

4. U. M., male; suspicious ulcerations in the larynx. The aspect a general tubercular condition. Tubercle bacilli were demonstrated in the sputum, Sept. 23, 1909.

Tubercular Tonsils.

5. Master B., no clinical history. Diagnosis of tuberculosis from hypertrophied tonsils after removal, Nov. 23, 1909.

6. Mrs. W., housewife, positive tubercle bacilli found in hypertrophied tonsils after removal. No history.

7. Mr. N., farmer, no clinical history. Diagnosis of tubercle from hypertrophied tonsils after removal, Aug. 9, 1909.

8. Miss W., aged 18 years. General health poor. Tubercle bacilli in hypertrophied tonsils after removal. No history.

9. Mr. C., diagnosis of tuberculosis from hypertrophied tonsils after removal. Sept. 3, 1909. No history.

10. Master D., hypertrophied tonsils removed, June 1, 1909. Tubercle bacilli associated with a large amount of degenerated tissue and deposits of calcium and caseation. No clinical history.

11. Mr. N., farmer, aged 35 years. Loss of weight; had hemorrhages. Tuberculosis of the lungs was suspected, but had not been determined. Many tubercle bacilli were found in the hypertrophied tonsils after removal, Aug. 9, 1909.

12. Master M., aged 12 years. Had loss of weight, loss of appetite, indisposition to play. General downward tendency. Tubercle bacilli were found in the crypts of the tonsils. No operation was performed. No lesions were found in the lungs, April 13, 1909.

13. Master W. F., aged 11 years. Was indisposed, loss of appetite, occasional loss of interest in play with a frequent tonsillitis and some fever, some enlarge-

ment of the tonsils and slight enlargement of the glands of the neck on one side. Refused to have the tonsils removed, so an examination of the tonsils was made May 19, 1909, inserting a probe deep in the tissue removing as much secretion as possible. This secretion showed the presence of tubercle bacilli.

MIDDLE-EAR WITHOUT ACTIVE MASTOID SYMPTOMS.

14. Miss B., aged 20 years. Recurrent secretion from middle-ear. Tubercle bacilli present, May 5, 1909. No history.

15. Mrs. J. C., aged 40 years. Had had discharge from middle-ear for fifteen years. Had a pulmonary involvement at the time she came to the sanitarium, July 10, 1909. Positive tubercle bacilli present in the discharge.

16. Miss P., no history Sept. 8, 1909. Had a viscid discharge from middle-ear which contained many granular forms of tubercle bacilli, also characteristic forms. No other involvement.

17. Miss N., had had a chronic otitis-media for five years. In every other way was in good health, Nov. 7, 1909. Suffered some inconvenience from the discharge. Tubercle bacilli were demonstrated. Two subsequent examinations did not show them.

18. Mr. K., aged 57 years. Had had discharge from middle-ear for fifteen years. Tubercle bacilli were demonstrated Nov. 28, 1909. Treatment with alcohol and salicylic acid for three months dried up the secretions. No recurrence was reported. Man was in perfect health otherwise.

19. Mr. H., aged 50 years about July, 1909. Middle-ear discharge. Tubercle bacilli present. Case was treated with tuberculin and recovery was reported.

20. Master D., November, 1909. Had middle-ear discharge for several months. General health was bad. No pulmonary condition had been noticed. Tubercle bacilli were demonstrated in the secretion. Later abscesses developed in the hip, knee and ankle.

MASTOID.

21. Mr. E., aged 25 years. Middle-ear discharge with mastoid involvement. Radical operation was performed May 29, 1909. This was a mixed infection with streptococcus. Complete recovery was the result.

22. Miss H., aged 40 years. Had had a chronic middle-ear discharge for ten years. Mastoid involvement. Radical operation was done Dec. 4, 1909. Ten days later patient developed general tuberculosis and died.

23. Miss B., April 17, 1909. Had an acute attack of otitis-media with high temperature, enlarged glands and loss of weight. Mastoid became involved. Discharge contained tubercle bacilli. Radical operation was done May 17, 1909, and patient was cured.

24. Mr. A., May, 1909. Had a chronic discharge of the middle-ear. Mastoid became involved. Tubercle bacilli were present in the discharge. Operation was followed by considerable pain and tubercular discharge continued for four weeks. No later report has been made.

25. Mrs. C., came to us with a mastoid involvement, and a tubercular discharge of the middle-ear, which had been chronic for years. Radical operation was performed, but a viscid discharge containing tubercle bacilli persists.

26. Mrs. S., came to us with a middle-ear discharge and mastoid involvement. No previous history was obtained. Radical operation was performed and patient made a good recovery.

27. Mr. M., aged 21 years. Had recurrent attacks of otitis-media. He came to the sanitarium with a discharge. Tenderness over the mastoid and other symptoms of mastoid involvement. Tubercle bacilli were found in the secretions. An operation May 8, 1909, was performed, but the wound did not heal readily. Granulation did not form over the exposed bones. Later he had a consolidation in the right lung. Soon after this was observed he went from us to another city where another operation was attempted but the patient died on the table.

NASAL.

28. Mr. M., aged 45 years, December, 1908. Had an ulcer on the bridge of his nose, which failed after the most vigorous antiseptic treatment for eight months to heal. The scrapings of this showed the tubercle bacilli. Cauterization with thermo-cautery permanently removed the condition.

29. Mr. H., April 6, 1909. Had been suffering with chronic acne for many years. Was suffering from hypertrophy of the mucous-membrane and turbinates. Had a recurrent pustule in the external nasal orifice. An examination of this pustule showed the presence of tubercle bacilli. This particular pustule was so similar to others on the body, that out of curiosity an examination of about twenty of the others were made with the result that of the twenty, three showed the presence of positive tubercle bacilli. The general health of this patient had been bad for several months. He had lost considerable weight, and occasionally had temperature, and had such a constant feeling of malaise that he had consulted three different physicians relative to constitutional trouble. Each of these made a careful physical examination with the result that no local tubercular focus was found. Patient still continues in same condition.

30. Mr. H. G., aged 27 years. Had an ulcer of the septum, examination of the scab from which showed the presence of tuberculosis. This was removed permanently by the use of the thermo-cautery, May 5, 1909.

FRONTAL SINUS.

31. Master B., aged 11 years. Had adenoids and abscess of the frontal sinus. Operation was performed on both Sept. 3, 1909. Diagnosis of tubercle bacilli in the concretions from the sinus was made after the operation. Patient recovered.

32. Mr. R., aged 35 years, Sept. 3, 1909. Had a general tubercular aspect with discharging abscess of the frontal sinus and maxillary sinus containing tuberculosis. No operation was performed. Patient continues in about the same condition.

PALATE.

33. Mr. W., aged 48 years. Had slight irritation of the throat for which he came to the sanitarium. Man is well nourished, enjoys perfect health in every other way. The irritation had continued for several months previous to consulting us, at this time he coughed up white putrid masses. Two patches were observed above the uvula. These patches somewhat resembled thrush, they showed but little inflammatory condition. The examination of the scraping from these areas, however, showed the presence of tubercle bacilli. Thermo-cautery performed August, 1909, removed the condition entirely.

ANTRUM.

34. Miss S., aged 18 years. Was well nourished and enjoyed good general health in every way except that she had thickening of mucous membrane of the nose with constant purulent discharge. Came to us with a pain in the antrum with symptoms of antrum involvement on the right side. An operation was performed March 5, 1910, and the antrum was found filled with a large amount of caseous material having a fetid odor. This material contained many tubercle bacilli. Up to the present time no complications have developed.

ETHMOIDAL.

35. Mrs. G., aged 38 years. Had been in declining health for two years. Had lost weight, had temperature and general tubercular aspect. Had constant headache. Had a profuse nasal discharge. Pulmonary tuberculosis was suspected, but no such condition was found. There was no cough, no tubercle bacilli in the sputum, but the nasal discharge contained many tubercle bacilli. The source of the discharge was located in the ethmoid. Operation was performed Jan. 17, 1910, but some discharge continued for six weeks, at which time the patient went out of our care.

36. Mrs. B. H., aged 23 years. Had loss of weight, afternoon temperature, malaise, general weakness, indisposition, constipation and constant headache. Occasionally attacks of heart failure and fainting, when the pulse would become almost imperceptible. Tuberculosis was suspected. At least eight physicians examined this case with the result that not one of the eight could locate a tubercular focus. Frequent examinations of the sputum failed to show the presence of tubercle bacilli. February, 1908, while in the sanitarium to find relief from the headache, the patient happened to be in the office when she suddenly become slightly gagged from an obstruction in the air passage. Inquiry in regard to the cause of the peculiar facial movements at the time, divulged the fact that two or three times a week, she was in the habit of going through these contortions in order to get rid of a mass of secretion, apparently coming from the nasal cavity. The appearance of this mass when removed showed that it was about the size of the little finger nail, and flattened conforming to the shape of the space beneath the middle turbinate. The consistency of this was gummy. It had a decidedly putrid odor. An examination of the material for tubercle bacilli showed the presence of them in very great numbers. An operation was performed; the ethmoid was eviscerated. This did away with the headache, temperature, constipation, in fact all of the general symptoms from which the patient suffered. Collapses from heart failure ceased, and the patient has constantly improved since that time, and feels that she owes her life to this operation.

From a study of this series of cases, we cannot make any positive declaration as to the nature of the development of tuberculosis in the regions described. But there are a number of conclusions which suggest themselves and to which we now wish to direct your attention.

First, tubercular laryngitis seems to be more often associated with a pulmonary, and general tubercular condition than the disease in other localities.

The result of our operations on tubercular tonsils would seem to indicate that when the disease is primary in this location it can be eliminated by tonsillectomy. The two cases in young boys at once suggest the advisability of a careful investigation of the tonsils to account for the many cases of retarded development in children.

Middle-ear infections with tuberculosis give rise to fewer general symptoms than the disease in other parts of the head, but when it extends to the mastoid it becomes serious and less amenable to treatment of any kind. There seems to be a greater danger from a general tuberculosis following operations in this region than elsewhere.

Tuberculosis of the mucous surfaces as is suggested by our cases of nose and palate involvement, seem to be readily curable by means of the thermo-cautery.

Such cases as case twenty-nine of our series with numerous tubercular infected pustules cannot help but strike one with the idea of the possibility of a hidden tubercular focus in the lungs or other part of the body, which constantly throws into the circulation tubercle bacilli to be carried to the peripheral circulation and there to be deposited where the resistance of the tissues is low. Such areas as the sight of a recent acne pustule offer a fertile field for a new tubercular process to start.

By keeping in mind such symptoms as we have detailed in the two cases of ethmoidal tuberculosis, we believe that many obscure general

conditions not diagnosed could be accounted for by making a more thorough examination along these lines.

Our study of this subject has impressed us most emphatically with one fact, and that is, that too little attention has been paid in the past to the possibility of tuberculosis in the ear, throat and nose.

THE DAVID PRINCE SANITARIUM.

THE TREATMENT OF RECTAL FISTULA.*

J. RAWSON PENNINGTON, M.D.
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CHICAGO

Many methods have been advocated for the treatment of rectal fistula. I shall refer to only three of them, viz.: simple incision; the injection of bismuth paste; the incision or excision with immediate suture (proctorrhaphy).

1. *Simple Incision.*—The method of simple incision and allowing the wound to heal by granulation is and has been employed almost universally for many years in the treatment of this disease. Those of us who are operating quite frequently, for this malady, know its disadvantages, drawbacks and frequent failures to cure. This operation has done more than any other, unless it be that of the ligature or clamp and cautery for hemorrhoids, to bring disrepute upon rectal surgery. The laity dread, to this very day, a rectal operation more than any other surgical procedure because of the fear of pain, and the fear of recovery with the loss of control over the bowels. Yet, we know that each of the above operations in the hands of experts may give good results. The following are some of the objections to the simple incision method of operating for fistula:

(a) Low percentage of cures: Tuttle says "in 2,196 cases operated on by surgeons in general hospitals less than 45 per cent. of them were even claimed to have been cured." When you recall that perhaps at least 15 per cent. of these were simple anal fistulas, all of which were amenable to treatment and cured, you will observe that less than 30 per cent. of the remaining cases were even claimed to have been cured, an appallingly low percentage of cures. He does not say all these cases were operated on by the incision method, yet, it is safe to infer as much, since it is practically the universal one employed in the treatment of this disease. This large percentage of failures was due, doubtless, in a large number of cases to faulty technic or a lack of knowledge of the character of the fistulous tracts; very important points to comprehend in the intelligent treatment of fistula.

Many of the unsuccessful cases operated on by this method have been attributed to the overlooking of some sinus or tract, or, to the failure to

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* Read before the Twelfth Annual Session of the American Proctologic Society at St. Louis, Mo., June 6 and 7, 1910.

make Salmon's "back cut." Each of these omissions may be responsible for an occasional failure, yet, to my mind there are other and perhaps more important reasons for these failures.

(b) Incontinence: incontinence of feces to a greater or less degree frequently forms another distressing and loathsome sequel.

(c) Expense and length of time for recovery: The time of recovery may extend, and often does, over a period of many weeks, making it expensive and necessitating care and attention and the use of undesirable and painful dressings. The individual is compelled, therefore, to lose time from his work and forego society engagements.

(d) Cosmetics: The cosmetic effects are generally bad, leaving scars, sulci and irregularities about the anus. In some instances this makes it almost impossible to maintain a respectable toilet.

Notwithstanding these and other objections that might be mentioned, this method is, has been, and will be the one most generally used for some time to come.

2. *The Injection of Bismuth Paste.*—My attention was first directed to the use of bismuth vaselin paste by my colleague and friend, Dr. Emil G. Beck, who discovered it. The results obtained by him in the treatment of chronic sinuses and fistulas led me to try it in the treatment of rectal fistula. Dr. Beck had used it more especially in the treatment of sinuses and fistulas in other parts of the body. My results in the first seventeen cases seemed marvelous, 75 per cent. apparently cured. Later I found it necessary to operate on two of the cases that I had counted in my list as cured. This reduced my percentage in the seventeen cases to about 65 per cent. This method of treatment looked so promising that I hastened to make it known that others might enjoy the same benefit. Later results were not so favorable. I hope that Dr. Beck, in his discussion of my paper, will not fail to explain this discrepancy. I see in one of his articles that Dr. Baer, of Baltimore, had a similar experience. He treated two series of cases at two different hospitals; all of his cured cases were treated at the Union Protestant Infirmary. While at the Johns Hopkins Hospital he and Dr. Kennard could not obtain a single cure. Strange, isn't it? This difference in results is attributed to the way in which hydrolysis of subnitrate of bismuth of different manufacturers takes place at the body temperature. Dr. Baer has advanced the theory that the subnitrate is hydrolyzed by the heat of the body and free nitric acid is given off, which is probably the curative agent.

Formerly I treated all of my fistula cases with the paste; now I select them and am having better results. I can now generally tell after one, two or three treatments with the paste whether it will do any good to continue. The paste consists of one part of bismuth subnitrate and two parts of sterile vaselin. Technic: This is very important. To treat a rectal fistula the paste is liquefied by heating in a water bath and injected into one of the openings with either a glass or metal syringe. The other opening or openings are kept closed by an assistant while the injection is being made. Enough force is used until one feels reasonably sure that all tracts and diverticuli have been filled. The paste rapidly

congeals. If necessary an ice pack may be applied for a few minutes over the injected field. If too much tension is used the paste may be forced into some line of cleavage, then carried along this line to some distant organ or healthy tissue and deposited there with deleterious results. I know this from experience.

3. *Excision or Incision with Immediate Suture* (Proctorrhaphy).—This is the most rational of all surgical procedures for the treatment of rectal fistula when it can be employed.

Technic: Dissect and remove the entire tract when a probe or director can be passed through the fistulous channel and into the rectum. Then search and remove any diverticuli or tracts connected with the main tract. If this cannot, or should not be done, then incise the fistula and dissect out all granulation tissue. If needs be the wound is disinfected with carbolic acid and alcohol. The incision is then ready to be closed.

Suturing: Be sure that all bleeding is controlled before closing the wound, otherwise a hematoma may form and prolong, if not defeat, the operation. Suturing the wound is sometimes very difficult to accomplish and often requires much ingenuity. It may be done by Lembertizing the line of incision from its termination within the rectum to the anus. The ends of the severed sphincters, as well as the deeper portions of the incision, are brought together next with interrupted buried cat gut sutures. The final suturing of the skin and fascia is done with interrupted silk-worm gut.

After the wound is closed do not attempt any fancy stunts, such as pulling the mucous membrane down over the wound and stitching it to the skin; or, covering the line of sutures with a collodion dressing. Dress the wound with iodoform or plain gauze and apply a T bandage. At the end of three or four days give the patient an injection of three or four ounces of olive oil and follow in six or eight hours with another consisting of a pint and a half of water, in which 30 or 40 grains of inspissated oxgall have been dissolved.

The mucous membrane, sphincters and some of the deeper structures may be closed and a drain inserted in those extensive complicated cases where distal and vital organs or structures are involved, or where there is doubt about having removed all of the sinuses. After union occurs between these tissues you will observe that you have an external rectal sinus in lieu of a fistula with which to contend. This sinus may be closed with the paste since the stercoral source of infection is shut off.

Proctorrhaphy or the paste or a combination of the two seem to offer the nearest approach we have to the ideal method of treating extensive and complicated cases of rectal fistula. The opening into the rectum being closed by proctorrhaphy—and practically all such openings can be closed by this means—the fistula is converted into a rectal sinus. The internal source of infection now being shut off the odds are in our favor for closing the sinus with the paste; and this, too, without loss of control

over the bowels, and without scars, sulci or irregularities of the anus. In fact, the cosmetic and physiologic effects of the rectum and anus remain practically perfect.

103 State Street.

HYSTERECTOMY AS A CONSERVATIVE PROCEDURE.

HOWARD CRUTCHER, M.D.

Formerly Instructor of Surgery in the University of Illinois; Formerly Consulting Surgeon of the Chicago & Alton Railroad.

ROSWELL, N. M.

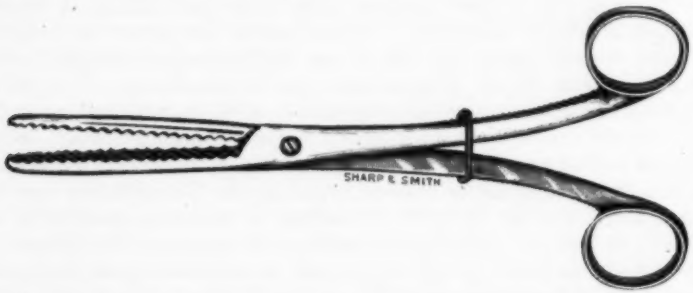
For something like fifteen years I have advocated and practiced what I may here call conservative hysterectomy. By this term I mean the prompt removal of a useless organ, after its uselessness has been demonstrated, the moment that it becomes the source of danger to bodily health. Many a useless uterus travels along its course from the cradle to the grave without becoming a menace to health or life, and there can be no surgical justification for attacking such an organ.

There is, unfortunately, no great hope in any case that can be demonstrated as uterine malignancy. When cancer arrives at the stage of clinical demonstration, the case is practically hopeless, although much may be done in the line of palliation. In the present state of our knowledge malignant disease is one thing that must be dealt with about as the civil officers deal with what are known as "suspicious characters." Some civil as well as surgical blunders will doubtless be made, but the wisdom of this principle of action cannot be questioned. The objection is sometimes raised that the principle of treating all suspicious growths by the radical method will bring about a number of unnecessary operations. I grant that this is true, but it may be said in extenuation that such cases almost invariably recover, whereas a policy of delay is as certainly fatal.

What I desire to emphasize is that I would not by any means limit the operation of hysterectomy to cases of suspected malignancy. Any uterus that is both useless and troublesome ought, in the absence of contraindications, to be removed before it becomes the seat of danger. Let it be distinctly understood that a womb that is merely useless, and not troublesome, should be left alone, since there is nothing to attract attention to it.

Many lacerations of the uterus received during childbirth are not confined to the cervix by any means, but often extend far into the broad ligaments, and such conditions are incurable by ordinary means. Women with such lacerations are "always sick, with nothing the matter." They linger from year to year, always complaining, often in bed, never really "seeing a well day." Repeated curettements do no good, and a repair of the cervix is useless, since it falls far short of reaching the whole trouble. The fact is that such organs are damaged beyond hope of repair, and whilst they may never become the focus of cancer, it is certain that many of them keep their possessors in a state of chronic ill health, from which nothing short of complete removal will relieve them.

Since my removal to New Mexico, two years ago, I have in association with Dr. Galloway operated myself or been the assistant to him in sixteen vaginal hysterectomies. There has been no operative death in the series, although one patient died from fulminating appendicitis after recovery from the hysterectomy. Not one of these operations has been performed for demonstrated malignancy. Growing myomata, immense lacerations involving the broad ligaments, and incurable cases of prolapsus make up the list. One woman, aged 35, went into convulsions at every menstrual period. Inordinate doses of morphin were required to relieve her sufferings. A vaginal hysterectomy raised her from a condition of chronic invalidism to almost perfect health within the space of a few months. A woman of 28, pregnant ten weeks, with pernicious vomiting, acute pulmonary tuberculosis, and complete retroversion, upon whom we made repeated efforts to empty the uterus without result, was not only relieved but cured by a vaginal hysterectomy. But it is not my present purpose to dwell upon the special indications for hysterectomy, which are familiar enough to experienced surgeons. The operation having been decided upon, how shall it be performed?



In spite of the condemnation of some eminent men, I know of no safer, quicker, cleaner method than applying clamps to the broad ligaments, and cutting away the intervening tissues. This method has many advantages, and, so far as I am aware, the objections raised against it are more imaginary than real. In seventy vaginal hysterectomies I have no operative death to record, although I must say that I know of no single case of cure in malignant disease. In the absence of complete records, my recollection is that all the cancers returned, in one form or another, within months or years after the operation. The clamp operation may be performed more quickly, and, as I believe, more safely, in the hands of the ordinary operator than by any other means. A hundred men can apply a clamp with safety where one can attach a ligature under strained conditions to the broad ligament. Some of the bungling procedures, whereby the vaginal outlet is obliterated by a mass of polished hardware, are enough to disgust any experienced surgeon, but any number of clamps left in this position are less dangerous to life than one ligature improperly applied. The proper application of a ligature in the open is no trifling performance; many great surgeons believe that this one act

is the supreme test of surgical skill; but the tying of an important bloodvessel in a cramped situation is something that few men may with safety be trusted to do well.

Sir Frederick Treves, in his latest work, condemns the clamp with a classical sneer, and yet places the operative mortality of vaginal hysterectomy between 5 and 10 per cent., presumably cases treated by the ligature method. Certainly this estimate is too low. In the first place, it must be borne in mind that experimenting bunglers seldom or never report their deaths, and they are precisely the men who imitate with unfailing devotion the methods set down and practiced by such men as Howard Kelly and Frederick Treves. The audacious bungler attempting to carry out some classical procedure of a great operator always makes a sorry spectacle of himself and too often a well appearing corpse of his late patient. The application of a ligature to the uterine artery is no easy performance even in the hands of Howard Kelly, which fact is well known to Howard Kelly, and is but faintly appreciated by some of his clumsy imitators.

The application of a hemostatic clamp to the broad ligament should be the cool, deliberate act of a skillful surgeon, and not the snappy, hysterical performance of some nervous woman sewing on a button. Time is an essential feature. The blades of the instrument must take an even and secure hold, under firm pressure, and the lock fastened when it is clear that all is safe and perfectly secure. In any event, a safe margin must be left for the unavoidable shrinking of tissue, after the structures are cut away. A clamp applied with care and skill will never slip.

It is with some hesitation, in this connection, that I refer to the clamp that I had the honor to present to the profession through *The Medical Record* for February 29, 1896. This lock, so far as I know, was original with me, and consists simply in a steel ring which slides over serrated shanks. I have since modified the handle of this clamp, but the principle of the lock is so elementary that I see no practicable means of improving it.

My belief is that conservative hysterectomy through the vaginal route will in the future become an every-day procedure, performed always with proper regard for rightful surgical principles. Last of all, do I advocate any general campaign of promiscuous cutting and slashing upon the part of ambitious occasional operators, who had better leave their prospective victims to the devices of Nature, pure and undefiled. The ravages of disease are very serious, but they are milder than the mangling performances of bungling upstarts who suddenly awake to find themselves "surgeons." Any serious surgical procedure that cannot be performed with reasonable skill had better be left undone. The blunders of Nature ought not to be aggravated by the bungling of man.

ILLINOIS MEDICAL JOURNAL

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SEPTEMBER, 1910

THE POLITICAL SITUATION IN ILLINOIS.

Probably all our readers know that the citizens of Illinois have seemingly awakened to the seriousness of the political situation. Possibly many of them do not realize that the medical men are fully awake on this matter. From all parts of the state come evidences of activity on the part of the doctors, and as a result, the politicians are taking notice. They will pay some attention to the reasonable demands of the medical profession. We cannot too heartily commend the activity of our members.

First, we will mention the circular which is being sent by the Legislative Committee of the State Society, to every candidate for office at the primaries which will be held September 15, and we call attention to the responses which have been received, and are printed in this issue of the JOURNAL.

The Chicago dailies have commented on the work of the State Legislative Committee, and undoubtedly the circular of the committee will be a great help in preventing hostile legislation at the next session. In the Thirty-sixth Legislative District, composed of Pike, Adams, Calhoun and Scott counties, a committee has issued a circular which attacks two

candidates openly; these are Mr. Groves, of Camp Point, and Mr. Bolin, of Milton. Both of them voted for the osteopathic bill, and it is said Mr. Groves "played double." In Sangamon County, Dr. J. M. Bell, of Rochester, is making an active canvas for the lower house, with prospects of success. He is all right and should receive the support of every physician in Sangamon and Morgan counties. Mr. H. M. Wilson, of Springfield, had a good record in the last House. Elmer A. Perry, of Springfield, is charged with being attorney in many of the malpractice suits against physicians.

Dr. J. M. Allison, of Essex, again is a candidate and will probably be nominated.

Dr. M. B. Foster, of Olney, is again candidate for the nomination to Congress, and it is to be hoped he will be successful in this, as in past campaigns.

Dr. J. A. Wheeler, of Auburn, is a candidate for membership of the Republican State Central Committee.

There may be many other physicians running for office, whom we do not know. It appears that the medical interests of Illinois will be better looked after this year than ever before. Everyone familiar with the subject knows that a critical condition exists, which demands radical treatment. Let the county societies get busy and make their influence felt. Maybe then we can get some consideration at the hands of the people "high up."

CARNEGIE REPORT.

In this issue we are presenting further extracts from the columns of the various state journals, which almost without exception speak in favorable terms of the Carnegie Report. An exception to this rule is the attitude of the New York State *Journal of Medicine*. What excuse can be offered for the attitude of this journal we cannot imagine. The *Medical Standard*, of Chicago, published by J. E. Engelhardt & Co., whose columns reek with the advertisements of such proprietaries as Antikamnia, Neurosine, Pepto-Mangan, Papine, Tongaline, and many others, and which for several years has been a consistent supporter of the Illinois State Board of Health, devotes two columns which smack a great deal of the language of one of the members of the State Board.

We would pay little attention to the attitude of the *Standard*, were it not that it has been quoted as representing a considerable portion of the sentiment of the profession. The fact is that while the *Standard* contains much good material in its news columns, its editorial columns have not been such as to commend it to the better class of the medical readers and should not be considered as at all representing deliberate professional conclusions.

It will thus be seen that the Carnegie Report has received the endorsement of nearly every respectable medical journal. And the few exceptions may prove the rule that no matter how excellent a report it might be, it would receive some condemnation.

REPORT OF THE CARNEGIE FOUNDATION.

[From the West Virginia Medical Journal.]

That the author is not a physician does not lessen the value of the report or impair the wisdom of its conclusions, since, as has been said, it represents a study, not of "medicine in relation to teaching but of teaching in relation to medicine." Is medicine properly and efficiently taught, and if not, what changes in methods of teaching and in equipment are needed to bring us up to the level of the leading European nations? These are the problems for the solution of the Foundation, and as Mr. Flexner is an educator, and familiar with the many problems set before the schools and colleges, he is well qualified to undertake the work, whose completion we have in this thorough and clear presentation of conditions as they exist in the medical schools of this country and Canada. It is worthy of note that the findings are very similar to those presented in the several reports of the Council on Medical Education of the American Medical Association, whose efforts have resulted in great improvements in our medical schools in the past few years, thirty of the poorer schools having gone out of existence in the past five years.

That there has been an immense overproduction of physicians in the past; that very many of these were poorly equipped by lack of preliminary education and by indifferent medical teaching; that the public fails to discriminate between the well and the poorly equipped physician, and that as a result the sick are not served as well as they should be, are facts well known to physicians. That many medical schools have existed and still do exist solely for the profit directly and indirectly of the teacher, is a fact also well known, and this report points out very plainly a number of such schools and shows wherein they are defective. It is not surprising that the instructors in such schools do not like this report, and that one school has even entered a suit against the Foundation. If pushed in the courts the suit will serve the excellent purpose of having the defects of at least one indifferent medical school plainly shown to the public whose interests must ever be the first consideration.

The Carnegie Foundation Report is a most notable and valuable publication.

S. L. Jepson.

MEDICAL LIBRARY AT LA SALLE.

F. W. Matthiessen, former mayor and wealthy manufacturer of La Salle, has given the sum of $10,000 for a medical library in that city. The interest of this amount approximates to $500 annually, which will be used for the purchase of medical books and journals. A committee of medical men from La Salle, Peru and Oglesby, adjoining cities, have selected the first lot of books. Mr. Matthiessen's timely gift is much appreciated by the medical men of the neighborhood, and his example will be followed by wealthy men in other cities. On the other hand we hope that the medical men will show their appreciation of his munificence by perfecting themselves in the knowledge of medical science.

AMERICAN ASSOCIATION OF CLINICAL RESEARCH.

The American Association of Clinical Research, of which E. Stillman Bailey, of Chicago, is the president, and James Krauss, of Boston, 419 Boylston Street, is secretary, announces its second annual meeting in Boston, September 28, 1910.

Some very valuable contributions on Researches in Medicine and Surgery, in Prophylactic and Anaphylactic Medicine, in Mental Medicine, in Radiotherapeutics, in Metabolism, etc., are promised.

There will also be a public meeting. The cause of the Association, to secure the true facts and principles of medicine and to advance medicine on the basis of truth and not of whim, is the cause of every true physician. Every physician is most cordially invited to become a member. Applications and program will be forwarded on request.

Although most of the officers of the Association are homeopaths the object of it as announced seems laudable and we hope the members "will arrive."

CARNEGIE FOUNDATION.

[From the Journal of the New Jersey State Medical Society.]

We believe they give us substantially correct facts concerning them—facts which show faulty conditions in many of these schools which far exceed what we have believed—and the conclusions which these able and careful investigators have drawn from these facts will convince every intelligent physician that there is imperative need of radical measures which will bring the majority of these schools up to the acceptable and proper standard, or close their doors.

[From the Pennsylvania Medical Journal.]

It so happens that the question has been studied both by the commission of the Foundation, who represent the pedagogic view freed from sentiment for any of the so-called "sects" in medicine and from the intraprofessional interests of the practitioner; and by the Council on Medical Education of the American Medical Association who, about the same time that the report of the Foundation was issued, presented to the Saint Louis meeting of the American Medical Association the opinion of medical men who have given the question a careful consideration. It is gratifying that these two reports are so much in accord, and it is a good omen that public interest has been aroused to comment upon the investigation by a student of social conditions contained in this report to the Carnegie Foundation.

The situation is the same here as elsewhere. The best medical education costs more than the student can be asked to pay. If you want the best the alternatives are State Aid or Endowment, for to do nothing, to stand still when the rest of the world is advancing is to fall behind.

We do not feel called upon to sit in judgment upon the Milwaukee schools. They have undoubtedly done the best they could with the means at their disposal. All will agree, however, that one strong medical school in Wisconsin would be better than three competing schools.

THE CARNEGIE REPORT AND MEDICAL EDUCATION IN WISCONSIN.

[From the Wisconsin Medical Journal.]

While the ultimate effect of this report cannot now be even guessed at, its immediate action has been so stimulating that it must be considered one of the most important medical publications of the last decade. The fact is well established that an overproduction of physicians is going on. Medicine to-day

exists as a developed science to such an extent that in the four years devoted to its acquisition no time ought to be spared for the introductory work which is needed for its comprehension. Good medical education is cheaper in the end than poor medical education. But how good shall it be? No school can teach all there is to learn in medicine. The question becomes, at what stage in this process of education is it safe and is it economical to give the student his degree?

An examination of the statistics presented shows an existing laxity in regard to the entrance requirements which is continued by the rivalry of schools dependent upon fees for their support.

With the development of laboratory teaching the cost of giving anything like a good training in medicine has increased tremendously. With this increase in cost has come to a majority of the schools in all sections the necessity for enlarging the revenue by securing more students. To secure them in the face of strong competition with other institutions similarly situated, the fitness of the student and his preparation for undertaking the work have received scant consideration.

To hasten on to the practical bearing of this report on our problems in Wisconsin. Of the three schools, the two in Milwaukee are looked upon by the author of the report as being inadequate while the half school at the University is highly commended. There is no need of our feelings being hurt about the treatment of the Milwaukee schools; the report is no more severe in its condemnation of them than it is of scores of others in the class of schools dependent on fees for support. But in the opinion of the author of the report schools of this class belong to the past and not to the future.

We are not surprised that the reports of the A. M. A. Council and Carnegie Foundation produced, on their presentation, a profound sensation and immediately stirred up a bitter antagonism. The unfortunate thing for most of the objectors is that they expressed their judgment and took action hastily, before they had time to carefully read and digest the reports, form sound judgment and act wisely. It is reported that one of the St. Louis medical schools has commenced suit against the A. M. A. and also against the Carnegie Foundation for $100,000 damages. We are inclined to regard this as a helpful incident in the discussion and settlement of this question, because it will serve to awaken public interest in this controversy, and such interest is needed, as the public at large is far more vitally concerned than the medical profession.

There is little doubt that thirty or forty first-class medical schools with adequate laboratory, dispensary and hospital equipment, scattered throughout the United States, at accessible points, would be sufficient to supply all the physicians that are needed.

One of the most puerile arguments we have heard against the conclusions of these reports of the American Medical Association Council and Carnegie Foundation, is the one which really means that the closing of some of the smaller medical schools which have defective equipments and teaching methods, and whose fees are smaller, is against the interests of the "poor boy" who wishes to study medicine and who cannot afford the greater expenses of the better class of university medical schools.

We insist that the poor boy, or any other boy who decides to study medicine now, ought to have the most thorough education and training that the best medical college can give him. The rapid progress we are

making in the knowledge and practice of scientific medicine, and the fact we are educating the public to appreciate and demand thoroughness in medical education, require it.

Correspondence

DR. STUBBS WRITES AGAIN.

CHICAGO, August 16, 1910.

"There are none so blind as those who will not see."

To the Editor:—I have just received the JOURNAL for August, 1910. Good JOURNAL. It contains good "stuff." There is always something to criticize in a journal of the character of the ILLINOIS MEDICAL JOURNAL. If there were not it would not speak well for the JOURNAL.

Now, my dear Doctor, you are a good editor and conduct your JOURNAL in a remarkably good manner, equal to any journal in this great country. But sometimes you let your personal bias warp your judgment.

I note in the current issue of said JOURNAL, you say on page 238, to wit: "We notice this only to state the fact that the best legal authority has given an opinion; that when Dr. Collins announced that the vote on adjournment was in the affirmative the society stood adjourned; it was absolutely unnecessary for him to make any announcement or declaration whatsoever."

Who is this high authority who overrides every fundamental rule established to govern deliberating bodies since the beginning of organized governments?

I beg leave to differ with you; in fact I do most emphatically differ with your "ipse dixit." You are a good editor, a good doctor, but the average physician is a mighty poor parliamentarian and I think you must be classed among the number.

I too have consulted high, very high authorities on rules governing deliberative bodies. Roberts' Rules of Order, I think, are pretty good; yes, very good; best there is; the one that governs all high legislative bodies, national and state conventions, and his opinion is good enough for the Illinois State Medical Society.

Please get a copy, and turn to page 192, section 63, and you will find the following, if your eyesight fail not: "The motion being received (i. e., to adjourn) the chairman instantly puts the question, as it allows of no debate or amendment, and if decided in the affirmative he says, 'The motion is carried; *this Assembly stands adjourned.*'" Please read up, Doctor: *"error est humanum."* Again, a motion to adjourn *is not always in order.* You, Dr. Harris, and all "stand patters" to the contrary

notwithstanding, now take note: "The motion to adjourn cannot be made when another has been put, and the assembly is engaged in voting, but it is in order before the vote has been taken and before it has been announced." See Roberts' Rules of Order, page 39. My dear Doctor, please read the above; analyze them; criticize them as you will and satisfy yourself as to the correctness of my position.

Before a vote is decided any legal member of the assembly has a right to call for a division by a rising vote, ayes or nayes; or by a roll call.

This is not called in question by the veriest tyro in Rules of Order, and no presiding officer has the right or temerity to deny it, excepting Cannon or Sherman or Shurtleff, and we do not accept them as authority.

A vote is not a vote, a deciding vote, until all means have been granted to any member to cast his ballot or vote so that it is counted as he indicates. Now, then, in the House of Delegates of the Illinois State Medical Society at Danville, Dr. Lydston's resolutions were being discussed, and while a delegate (and I think it was Dr. Lydston) had the floor and was talking on the resolutions, a motion to adjourn was made and the acting president, Dr. Collins, put the motion. This was illegal. See Roberts' Rules of Order, page 39, again. I have consulted individuals of high authority in legal and political circles, men who have time and again acted as chairman in large political assemblies, and they invariably say the officiating officer must say the meeting, assembly or council stands adjourned, or is adjourned, to make it strictly technically legal and binding.

My dear Doctor, please give this the same publicity as you have your "ipse dixit" in the JOURNAL, on page 238, and believe me, as ever,

Yours, fraternally,

JAMES E. STUBBS, M.D.,
Second Vice-President, I. S. M. S.

MORE ABOUT DANVILLE MEETING

To the Editor:—In your issue of June 4, 1910, appears a letter from Dr. E. W. Weis, secretary of the Illinois State Medical Society, in which he states that the American Medical Association reform resolutions presented by Dr. G. Frank Lydston at the late meeting of the society were not regularly adopted. The undersigned, who were present at the meeting after the attempted adjournment, beg leave to submit the following:

Copies of the resolutions were mailed for publication to both the *Journal of the American Medical Association* and the ILLINOIS MEDICAL JOURNAL several weeks before the meeting and copies were freely distributed at the meeting. Thus it is demonstrated that there was no intention to spring them upon the society without warning and oppor-

tunity for due consideration. The subsequent history of the resolutions was a succession of endeavors by partisan officials to abrogate the right of free speech, and showed an intolerance on the part of various servants of the society which is contrary to the spirit in which our medical organizations were founded.

At the opening session of the House of Delegates a motion prevailed to "refer all resolutions which may be submitted to this body during the present session" to a committee of five appointed by the chair. The members of this committee were at once read from a list already prepared for the occasion. A motion then was carried to omit the second day's session of the House of Delegates.

The motive of the foregoing proceedings was recognized by everybody. The motion to refer all resolutions to a committee was afterwards rescinded when it was found to interfere with a resolution which one of the opponents of free speech himself wished to introduce. Therefore Dr. Lydston also had the chance to read his resolutions. A motion to table was made and lost on a roll-call. Before the motion to adopt could be put a motion to adjourn was made, for the self-evident purpose of preventing the adoption of the resolutions as read, which, with the then prevailing spirit of fairness of the House, would inevitably have occurred. The Chairman called for ayes and noes and, by what auditory and mental processes it would be difficult to determine, declared, "The ayes have it." At once Dr. Lydston called for a roll-call and was supported by a large number of delegates. The Chair refused and a large number of delegates left the hall. The claim that the Chair had declared the meeting adjourned was disproved by the official stenographer, who, on being appealed to, stated that his notes contained no such declaration. Dr. Collins then vacated the chair against protests and therefore the second vice-president, Dr. James E. Stubbs, was called to the chair, the resolutions were adopted in regular form and other important business was transacted. Dr. Weis made a claim of no quorum and proceeded to count the delegates. He counted nineteen who were standing and refused to count others, on demand, who were in the hall but declined to stand. The count by delegates badges made by many of the undersigned and others varied from twenty-three to twenty-five. The Chairman of the Medico-Legal Committee came in during the proceedings, and, according to the Secretary's own figures, made the number present at least twenty, the legal quorum. The Chairman, the only legal authority to decide on a quorum, declared a quorum present and the House of Delegates in due and regular session.

It is our earnest hope that it will not be necessary to resort to legal proceedings to establish the rights of those who participated in the passage of the resolutions. It is also our earnest hope that the right of every member of our medical societies to be heard upon any question

bearing on the interests of our organizations will eventually be recognized as the essence of true democracy.

Very respectfully,

Henry F. Lewis.
James E. Stubbs, Delegate.
C. B. King, Delegate.
George F. Butler, Delegate.
E. M. Webster, Delegate.
A. W. McLaughlin, Delegate.
A. R. Johnstone, Alternate.
C. S. Nelson, Delegate.
C. D. Pence, Delegate.
M. G. McHugh, Delegate.
J. E. Waggoner, Delegate.
Alice Conklin, Delegate.
James A. Egan.
W. A. Barr, Delegate.
C. E. Humiston, Delegate.
G. Frank Lydston, Delegate.
Ralph H. Wheeler, Delegate.
J. H. Edgcomb, Delegate.
Effie L. Lobdell.
George Bell, Delegate.
Charles R. Moore, Delegate.
Bismarck von Wedelstaedt, Alter.
J. W. Vanderslice, Delegate.
Anna M. Dwyer, Delegate.
K. A. Zurawski, Delegate.
Wm. L. Ballenger.

THE LEGISLATIVE SITUATION.

The legislative committee of the State Medical Society sent to every candidate for the State Legislature for the coming session a letter outlining the general attitude of the profession along medical legislative lines. This was done in order that there might be no misunderstanding between the profession and members of the Legislature after the session convenes. With the letter was inclosed a return postal with the following pledge written thereon:

If elected to the Illinois Legislature I will do my utmost to maintain one standard for all practitioners of medicine and will use my influence to defeat any legislation the object of which is to permit any cult to practice medicine at a standard of medical education lower than those already in the field under the pretext that its followers are not practicing medicine. I shall at all times support medical legislation which is in the interest of the people of the State and not for the interest of any special cult or school of practice. I shall vote to retain, in Illinois, a one board supervision over all medical matters, including the examination of candidates for practice. That the examination be for all alike, whether they belong to the now recognized schools of medicine or have tacked onto their names some "path," "cult" or "ism."

I will use my best efforts to help amend the medical practice act so as to give the State Board of Health supervision over all medical licenses issued by the State of Illinois.

Candidate from the.....District.

.....

.....

The committee submits the character of replies. S before the name of the legislator denotes that the pledge was signed and is satisfactory; E, that the answer was evasive; R, that he refused to sign; and blank before the name indicates that no reply had been received up to the time of going to press. As the time between mailing the letters and going to

press of the JOURNAL has been rather short, no doubt many pledges will be received after the forms are closed, but as eternal vigilance is the motto of the profession from now on, it behooves the candidates to act more promptly in the future.

A number of candidates are up for re-election and the way they voted at the last session on Bill 351 is indicated by the letters after their names. F after the name of the legislator denotes voting for the bill. A denotes voting against the bill and N. V. denotes not voting. This bill, if enacted, would have conferred upon the graduates of certain osteopathic schools all the rights and privileges of physicians and surgeons and would require the State Board of Health to license without examination all such osteopaths as graduated previous to July 1, 1909.

FIRST DISTRICT.—The First and Seconds Wards in the City of Chicago.

MEMBERS OF THE GENERAL ASSEMBLY

Republican—			
Senate	S—	Francis P. Brady—N. V.	1311 Michigan Ave.
		Hugh Richardson	3119 Calumet Ave.
		Herbert C. Metcalf	3239 Rhodes Ave.
House		Noble B. Judah, Jr	2701 Prairie Ave.
	S—	Edward D. Green	125 W. 26th St.
	S—	Frank L. Hamilton	2625 Wabash Ave.
		Alexander Lane—A	1937 Archer Ave.
Democratic—			
Senate		Edward D. Cooke	2248 Wabash Ave.
		Richard S. Folsom	2119 Calumet Ave.
House		John Griffin—A	2020 Indiana Ave.
		Lawrence Burns	2949 S. Park Ave.
	S—	Charles W. Espey	250 W. 22d St.
Prohibition—			
Senate		Stephen F. Welbasky	3131 5th Ave.
House		Geo. Derr Koontz	2011 Indiana Ave.
Socialist—			
Senate		Robt. Kurth	2923 Cottage Grove Ave.
House	E—	Axel Gustafson	1252 Michigan Ave.

SECOND DISTRICT.—The Twentieth Ward and parts of the Eleventh and Twelfth Wards, Chicago.

Republican—			
House		David Franklin Doubt	2126 Ogden Ave.
	S—	Roger J. Marcy	1953 Congress St.
		Frank J. McNichols—N. V.	1103 S. Winchester Ave.
	S—	Thomas J. Houston	228 S. Lincoln St.
	S—	William W. Haupt	1803 Hasting St.
Democratic—			
House		Geo. L. McConnell—F	218 Seeley Ave.
		Philip P. Bregstone	1020 Ashland Blvd.
Socialist—			
House		H. A. Miller	2309 W. Monroe St.

THIRD DISTRICT.—The Third and parts of the Fourth, Fifth and Sixth Wards, Chicago.

Republican—			
Senate		Charles Lederer—A	3641 Grand Blvd.
	S—	Samuel A. Ettelson—F	3315 Calumet Ave.
	E—	Oliver Sollitt—F	4020 Prairie Ave.
	S—	George F. Morgan	726 E. 42d St.
House		William Ostrom	3136 Princeton Ave.
		Kay Wood	3926 Michigan Ave.
		Frank Aims Marshall	4206 Ellis Ave.
	S—	John G. Jones	3717 Armour Ave.
		Maurice T. Winkler	4017 Michigan Ave.
		Alexander MacIntyre	3531 Princeton Ave.
		William Pettis	3814 Ellis Ave.
Democratic—			
Senate		Jeremiah P. McDonald	3256 Princeton Ave.
	S—	Thor. J. Benson	3228 Forest Ave.
		James M. Burke	504 W. 32d St.
		Joseph Friedman	4101 Grand Blvd.
House		John P. Walsh—F	738 31st St.
	S—	Patrick J. Wall	511 W. 27th St.

		Henry M. Ashton	3633 Lake Ave.
		Edward L. J. Dempsey	124 W. 33d St.
	S—	J. R. Johnson	3752 Armour Ave.
Prohibition—			
Senate	S—	Geo. W. Doolittle	3441 Vernon Ave.
House		Harold A. Deadman	3830 Elmwood Ave.
		Chas. J. Nyman	3349 Forest Ave.
Socialist—			
Senate		Owen Brown	3820 Rhodes Ave.
House		Isaac Peterson	3914 Ellis Ave.

FOURTH DISTRICT.—The Twenty-Ninth and Thirtieth Wards and part of the Thirty-First Ward, Chicago.

Republican—			
House	S—	Thomas A. Boyer	4454 Emerald Ave.
	S—	John Hrubec	1734 W. 51st St.
	S—	Daniel J. Nelson	508 W. 44th Pl.
		Geo. W. Lambert	829 W. 53d Pl.
Democratic—			
House	S—	George W. Lynch	723 W. 54th Pl.
		George C. Hilton	5437 Justine St.
		Martin L. Costello	447 W. 42d Pl.
	S—	Edward Brady	503 W. 45th Pl.
		Charles C. Cannon	5257 Centre Ave.
		Thomas F. Murphy	540 W. 45th Pl.
	S—	William Murphy—A	4356 Shields Ave.
		Hubert Kilens	5026 S. Ashland Ave.
	S—	Dan J. Daly	5038 Elizabeth St.
	S—	Bernard W. Lyons	4410 Wentworth Ave.
		George J. Ernst	5256 5th Ave.
		Frank Karas	4639 Marshfield Ave.
		Michael Doran	2559 39th St.
	S—	Isaac Miller	4159 Western Ave. Blvd.
Socialist—			
House		Joseph A. Ambroz	2039 W. 51st St.

FIFTH DISTRICT.—Parts of the Sixth and Seventh Wards, Chicago.

Republican—			
Senate		Walter Clyde Jones	5541 Woodlawn Ave.
House		Morton Denison Hull	4855 Woodlawn Ave.
		William Tudor ApMadoc—N. V	4845 Grand Blvd.
	S—	Arthur V. Lee	5100 Hibbard Ave.
	S—	James Linden	4433 Lake Ave.
Democratic—			
Senate	S—	Percival F. Fullmer	5495 Madison Ave.
House		Hiram T. Gilbert	5234 Woodlawn Ave.
	S—	Charles Naylor—F	4909 Wabash Ave.
	S—	Ignatius Brady	704 E. 50th Pl.
Prohibition—			
Senate		William H. McWhorter	5407 Wabash Ave.
House	E—	William F. Mulvihill	7024 Calumet Ave.
Socialist—			
Senate		Robert Waddell	5041 State St.
House	S—	P. G. Soderberg	6446 Vincennes Ave.

SIXTH DISTRICT.—The Twenty-Fourth and Twenty-Sixth Wards and parts of the Twenty-Third and Twenty-Fifth Wards, Chicago, and parts of the towns of Evanston, Niles and New Trier, all in the County of Cook.

Republican—			
House	S—	Richard P. Hagan—A	4303 Paulina St.
	E—	Wesley A. Stanger	Evanston.
		Charles E. Finkl	910 Willow St.
	S—	W. E. Anderson	Evanston.
		William F. Zipf	4533 Lyman Ave.
	S—	Louis Wolff	1811 Fremont St.
Democratic—			
House	S—	Joseph A. Weber	1919 Belmont Ave.
		Robert E. Wilson—A	4025 Perry St.
		Frank C. Adams	2214 Seminary Ave.
	S—	James M. Slattery	1522 Farwell Ave.
		Frank A. Stadler	1312 George St.
		Peter Dienhart	1911 Waveland Ave.
	S—	Mathias Aller	5027 N. Hermitage Ave.
Prohibition—			
House		Harry E. N. Stine	1947 Cornelia Ave.
		Dudley Grant Hays	1641 Estes Ave.
Socialist—			
House		Louis W. Hardy	3341 N. Leavitt St.

SEVENTH DISTRICT.—The towns of Thornton, Bloom, Rich, Bremen, Orland, Lemont, Palos, Worth, Lyons, Stickney, Proviso, Leyden, Elk Grove, Schaumberg, Hanover, Barrington, Palatine, Wheeling, Northfield, and parts of the towns of New Trier, Niles, Norwood Park and Maine, all in the County of Cook.

Republican—			
Senate	S	William H. Maclean—N. V	Wilmette.
		John Humphrey—F	Orland.
		William W. Loomis	La Grange.
House	S	Willard A. Warman	Melrose Park.
	R	Louis J. Pierson—N. V	Wilmette.
		Frederick B. Roos	Forest Park.
		Sidney T. Hart	Willow Springs.
Democratic—			
House		Walter A. Lantz—N. V	La Grange.
	S	J. J. O'Rourke	Harvey.
	S	Patrick W. Dunne	River Forest.
		Charles S. Cole	Glenview.
	S	William Cafferty	Lemont.
Prohibition—			
Senate		J. T. Ford	Arlington Heights.
		E. W. Hicks	Maywood.
House		C. Geo. Fleager	La Grange.
Socialist—			
Senate		Donald A. McQueen	Harvey.
House		Jas. A. Prout	Harvey.

EIGHTH DISTRICT.—The Counties of Boone, Lake and McHenry.

Republican—			
House		Edward D. Shurtleff—N. V	Marengo.
		A. K. Stearns—F	Lake Bluff.
		Christian T. Heydecker	Waukegan.
		David H. Jackson	Lake Forest.
		James H. Vickers	Harvard.
Democratic—			
House		Charles F. Hayes	Harvard.
		Thomas F. Burns—A	Belvidere.
		George F. Lynch	Libertyville.
	S	Joseph C. James	Antioch.
Prohibition—			
House		Joseph E. Anderson	Lake Forest.
Socialist—			
House		Frederick Mains	Highland Park.

NINTH DISTRICT.—Parts of the Fourth, Fifth and Twelfth Wards, Chicago.

Republican—			
Senate		Andrew Powers	3137 Archer Ave.
House	S	David E. Shanahan—N. V	3434 S. Paulina St.
	S	John J. Fruzyna	3043 W. 21st Pl.
	S	Hector A. Brouillet	3532 S. California Ave.
Democratic—			
Senate	S	Patrick J. Carroll	3827 Campbell Ave.
		Oliver McCormick	748 W. 35th St.
	S	James J. O'Meara	2861 E. Loomis St.
		William Bigane	3612 S. Hamilton Ave.
	S	Peter P. Jezierny	2244 Marshall Blvd.
House		Edward J. Murphy—F	3520 Emerald Ave.
	S	Argess M. Evans	2329 W. 35th Pl.
		Robert J. Mulcahy	3124 Archer Ave.
		Robert H. Reagen	3600 S. Ashland Ave.
	S	Eugene J. Danaher	3627 S. Halstead St.
	S	James R. Murphy	3641 Wallace St.
		Philip P. Sullivan	1600 35th St.
		Paul A. Messenie	3310 S. Leavitt St.
		Rudolph Stoklasa	2247 S. Kedzie Ave.
	S	Edward F. McGuirl	3408 S. Leavitt St.
Prohibition—			
Senate	S	Elias S. Lloyd	3024 Lloyd Ave.
House	S	Otto J. Krampikowsky	2642 W. 23d St.
	S	Stewart McDonald	3252 S. Irving Ave.
Socialist—			
Senate		Chas. Toepper	2637 W. 20th St.
House		William Cherney	2505 S. St. Louis Ave.

TENTH DISTRICT.—The Counties of Ogle and Winnebago.

Republican—			
House		John A. Atwood	Stillman Valley.
		Alexander Collier	Rockford.

		Victor H. Bovey	Oregon.
		George F. Tullock	Owen.
Democratic—			
House		Pike Dernier	Oregon.
	S—	Mark T. Storen	Rockford.
		John Coleman	Rochelle.
		Hugh J. Gallagher	Rockford.
		James J. Burns	Burritt.
Prohibition—			
House		Wiley S. Johnson	Byron.
		J. M. Woodard	Rockford.
Socialist—			
House		R. H. Youngburg	Rockford.

ELEVENTH DISTRICT.—The Thirty-Second Ward and part of the Thirty-First Ward, Chicago.

Republican—			
Senate		Carl Lundburg—A	5727 Sangamon St.
	S—	William H. Reid	5520 Green St.
House		Donald H. McGilvray	6932 Lowe Ave.
		Henry D. Fulton—F	444 Englewood Ave.
		[1] Chester W. Church—F	9244 Winchester Ave.
		Amos H. Cooley	1717 W. Garfield Blvd.
Democratic—			
Senate		Patrick J. Devlin	537 W. 62d St.
		Timothy C. Charles	5747 Sangamon St.
		W. J. Stennett	6334 Center Ave.
House		Thomas F. Malone	6511 Justine St.
	S—	John H. Collins	9644 Longwood Ave.
		William Slaven	539 W. 61st Pl.
	S—	James J. O'Toole—N. V	6536 S. Marshfield Ave.
	S—	Frank J. Ryan	6828 Bishop St.
		Thomas M. Crane	1143 W. 63d St.
	S—	Thos. J. Moore	5741 Peoria St.
Prohibition—			
Senate		Harold Rountree	7321 Princeton Ave.
		Wm. C. Gibons	7210 S. Peoria St.
House	S—	Erik A. Erickson	7621 S. Sangamon St.
Socialist—			
Senate		John D. Dobelman	6343 S. Halsted St.
House		Paul C. Lorenz	6154 Aberdeen St.

TWELFTH DISTRICT.—The Counties of Carroll, Jo Daviess and Stephenson.

Republican—			
House	S—	W. W. Gillespie—N. V	Savanna.
		Stephen Rigney—N. V	Red Oak.
		W. T. Rawleigh	Freeport.
		J. J. Shaffer	Rock Grove.
Democratic—			
House	S—	Martin J. Dillon—A	Galena.
	S—	R. R. Thompson	Kent.
		Henry B. Witte	Freeport.
		Chas E. Gray	Rice.
Prohibition—			
House	E—	Theodore F. Ellis	Winslow.
		J. H. Keagle	Cedarville.
Socialist—			
House		W. H. McCall	Freeport.

THIRTEENTH DISTRICT.—The Eighth and Thirty-third Wards and parts of the Seventh Ward, Chicago, and part of the town of Calumet, all in the County of Cook.

Republican—			
Senate	S—	Albert C. Clark—F	7131 Euclid Ave.
	S—	Edward M. Roby	10805 Ave. J.
House		Benton F. Kleeman—F	11444 Prairie Ave.
		John A. Swanson	6842 Washington Ave.
	S—	Mortimer H. Moore	161 E. 111th St.
	S—	Charles Deutschmann	7107 Langley Ave.
		Oscar Wolff	10052 Ewing Ave.
Democratic—			
Senate		John Prystalski	11037 Curtis Ave.
	S—	James Kirby	7436 Yates Ave.
House	S—	M. L. Kensington	6307 Woodlawn Ave.
	S—	Charles J. Phillips	7209 Evans Ave.
		James J. Mulcahey	11418 Indiana Ave.
	S—	George N. Morgan	7646 Marquette Ave.
	S—	Carl P. Morgan	3203 E. 92d St.
		Timothy Dunne	2906 78th St.

1. Mr. Church is responsible for the vicious medical bills in the last two sessions. He should be retired.

Prohibition—
Senate.....Perry Kim.....17 W. 109th St.
House.....S—George A. Cressey.....Morgan Park.
Socialist—
Senate.....Nels Anderson.....11640 Yale Ave.
House.....Bernard Berlyn.....865 E. 63d St.

FOURTEENTH DISTRICT.—The Counties of Kane and Kendall.

Republican—
House.....E—Frank W. Shepherd—N. V.....Elgin.
S—Isaac Eugene Bennett.....Plano.
W. M. Mercer.....Aurora.
Arwin E. Price—N.V.....Elgin.
Frank R. Reid.....Aurora.
August L. Anderson.....Elgin.
Democratic—
House.....E—George W. Alschuler—A.....Aurora
Edward G. Harvey.....La Fox.
Prohibition—
House.....J. I. Ellsworth.....Campton.
O. W. Beebe.....Yorkville.
Socialist—
House.....Theodore F. Klees.....Aurora.

FIFTEENTH DISTRICT.—Parts of the Ninth, Tenth and Eleventh Wards, Chicago.

Republican—
Senate.....S—John M. Sienkiewicz.....1838 S. Ashland Ave.
S—James J. Cullen.....1431 Newberry Ave.
Robert T. Novak.....1116 W. 19th Pl.
House.....Thos. Curran—A.....2023 S. Center Ave.
Frank J. Karch.....1722 S. Ashland Ave.
S—Anthony Novotny.....1919 Blue Island Ave.
Democratic—
Senate.....Edward J. Forst—A.....1817 S. Ashland Ave.
House.....S—[2]John O. Hruby, Jr.—A.....1806 S. Centre Ave.
S—Peter F. Smith.....1608 S. Union St.
S—John W. Riemer.....1655 W. 18th St.
Michael Rayspis.....1942 5th St.
S—F. W. Rausch.....1741 W. 19th St.
S—William J. Laskowski.....1701 S. Ashland Ave.
P. C. Daily.....2037 Canalport Ave.

SIXTEENTH DISTRICT.—The Counties of Livingston, Marshall, Putnam and Woodford.

Republican—
House.....Josiah Kerrick—F.....Minonk.
S—H. T. Ireland—F.....Washburn.
Matthew Van Petten.....Washburn.
S—Will L. Talbott.....Pontiac.
Democratic—
House.....Michael Fahy—F.....Toluca.
James M. Maguire.....Campus.
A. F. Ruddy.....Blackstone.
Christian Haase.....Washburn.
James W. Tracey.....Toluca.
S—E. M. Johnson.....Pontiac.
David J. Neuerburg.....Pontiac.
S—J. D. Jenkins.....El Paso.
S—L. C. Gish.....Eureka.
Prohibition—
House.....Marion Gallup.....Pontiac.

SEVENTEENTH DISTRICT.—The Nineteenth Ward and parts of the Ninth and Tenth Wards, Chicago.

Republican—
Senate.....S—Michael Cataldo.....949 W. Polk St.
House.....S—[3]Edward J. Smejkal—A.....560 Bunker St.
Charles J. Herman.....1316 Macalister Pl.
Democratic—
Senate.....Edward J. Glackin—F.....618 S. Morgan St.
S—Joseph D'andrea.....817 S. DesPlaines St.
House.....Emanuel M. Abrahams.....901 W. 12th St.
S—John S. Burns.....622 Blue Island Ave.
Harry White.....715 Blue Island Ave.

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2. Mr. Hruby, a wheelhorse in the last session, should receive support of every physician.

3. Mr. Smejkal saved the day for the profession at the last session. Every physician must loyally support him.

	S—Henry Hogan		1019 W. Polk St.
	Patrick Morris		1122 S. May St.
	Tony Trimarco		835 Miller St.
	Peter F. Galligan—F		523 S. Morgan St.
	Frank Navigato		1057 W. Taylor St.
	S—Paul Rissman		1256 Washburn Ave.
Socialist—			
Senate	H. W. Tischer		619 Aberdeen St.
House	A. Dubin		1135 S. Halsted St.

EIGHTEENTH DISTRICT.—The County of Peoria.

Republican—		
House	Lucas I. Butts—F	Peoria.
	Ira J. Covey	Peoria.
	S—Henry Ludwig	Peoria.
	Charles W. Ross	Peoria.
	S—Henry W. Harding	Hanna City.
	George E. Green	Peoria.
Democratic—		
House	Thomas N. Gorman—F	Peoria.
	S—John E. Dempsey	Peoria.
	S—William F. Peppard	Princeville.
	Woodson Morgan	Peoria.
	S—Charles H. Condon	Hanna City.
Prohibition—		
House	George Belford	Princeville.
Socialist—		
House	Samuel Edwards	Peoria.

NINETEENTH DISTRICT.—The Thirteenth and Thirty-Fourth Wards and part of the Twelfth Ward, Chicago, the Town of Riverside and part of the town of Cicero, all in the County of Cook.

Republican—			
Senate	S—Charles E. Crulkshank—F		3043 W. Jackson Blvd.
	Will C. Moody		2934 Warren Ave.
House	Charles A. Schumacher—N. V		4055 W. 26th St.
	James M. Kittleman—N. V		Berwyn.
	S—John Christenson		Cicero.
	S—Joseph C. Blaha		3736 W. 13th St.
Democratic—			
Senate	Thomas J. Lynch		4249 Carroll Ave.
	John T. Denvir		1847 S. 40th Ave.
	John J. Hickey		1538 S. Trumbull Ave.
	Harry Woods		3000 Warren Ave.
	Richard B. Considine		2703 Jackson Blvd.
House	John J. McLaughlin—F		3105 Washington Blvd.
	Edward J. Cassin		2458 Millard Ave.
	Thomas D. Garry		3932 Fillmore St.
	Patrick F. Ryan		3835 Harvard St.
	Joseph A. McInerney		4427 West End Ave.
Socialist—			
Senate	S—Walter Huggins		2626 Adams St.
House	S—W. G. Zoeller		1358 41st Ct.

TWENTIETH DISTRICT.—The Counties of Grundy, Iroquois and Kankakee.

Republican—		
House	Israel Dudgeon—F	Morris.
	Geo. H. Hamilton—F	Watseka.
	S—Fred Harford	Verona.
Democratic—		
House	J. W. Allison—A	Essex.
	R—Frank M. Crangle	Watseka.
	S—Charles Brown	Clifton.
	Phil Karcher	Herscher.
Prohibition—		
House	Phillip A. St. John	Onarga.
Socialist—		
House	S—L. E. Miller	Onarga.

TWENTY-FIRST DISTRICT.—The Fourteenth Ward and parts of the Seventeenth and Thirty-Fifth Wards, Chicago.

Republican—			
Senate	William H. Dellenback—F		3254 Walnut St.
	S—Nicholas Hamel		1756 Huron St.
House	Frederick E. Erickson		658 N. Carpenter St.
	William F. Gailing		3414 Franklin Blvd.
	Charles J. Ryberg		715 N. Ashland Ave.
	William H. Troyer—F		531 N. Central Park Ave.

	Edward Newman	3015 Fulton St.
	Harry J. Cronin	2946 Walnut St.
S—	Charles G. Dixon	1721 Austin Ave.
Democratic—		
Senate	Girard A. Ellingson	5508 Frink St.
	John E. Madigan	334 N. Artesian Ave.
	George W. Baker	228 N. Walnut Ave.
House	Benjamin M. Mitchell	241 N. Sacramento Blvd.
	Thomas J. O'Brien—A	527 N. Morgan St.
	Joseph J. White	2249 W. Erie St.
S—	William J. Ricer	1131 W. Chicago Ave.
Prohibition—		
Senate	Albert H. Humphrey	179 N. 51st Court.
House	John Nelson	1336 W. Ohio St.
Socialist—		
Senate	Jas. W. Johnston	1902 Park Ave.
House	H. W. Harris	526 N. Avers Ave.

TWENTY-SECOND DISTRICT.—The Counties of Edgar and Vermilion.

Republican—		
House	William P. Holaday—F	Georgetown.
	J. Ed Thomas	Danville.
	Isaac N. Cooley	Paris.
S—	R. W. Fisk	Ridgefarm.
Democratic—		
House	Andrew B. Dennis	Danville.
S—	William B. Redden	Danville.
Prohibition—		
House	S—Clay F. Gaumer	Alvin.
Socialist—		
House	Peter N. Christenson	Grape Creek.

TWENTY-THIRD DISTRICT.—The Fifteenth Ward and parts of the Sixteenth and Thirty-Fifth Wards, Chicago, and part of the town of Cicero, all in the County of Cook.

Republican—		
Senate	Niels Juul—N. V	2645 Potomac Ave.
House	George A. Miller	Oak Park.
	Joseph P. Kinsella	1345 N. Robey St.
	Christopher Beck—A	1510 N. Kedzie Ave.
Democratic—		
Senate	Bernard J. Mahony	1448 N. Kedzie Ave.
	Clarence W. Shaeffer	1314 N. Rockwell St.
	Wm. T. Payne	Oak Park.
House	Patrick F. Murray—F	2649 W. Cornelia St.
	Joseph Strauss	1252 N. Robey St.
	George R. Bruce	1419 N. Ridgeway Ave.
	Isaac A. Doff	1346 N. Paulina St.
Socialist—		
Senate	John T. Hammersmarck	2007 Evergreen Ave.
House	C. M. Madsen	3328 Beach St.

TWENTY-FOURTH DISTRICT.—The Counties of Champaign, Moultrie and Piatt.

Republican—		
House	Charles Adkins	Bement.
S—	Seymour Marquiss	Monticello.
	Lucas Lambrecht	Sullivan.
	Joseph Carter—F	Champaign.
S—	Julius N. Rodman	Deland.
S—	Levi Seass	Arthur.
Democratic—		
House	Marion Peters	Urbana.
S—	W. E. Stedman	Sullivan.
Prohibition—		
House	S—L. B. Pickerell	Deland.

TWENTY-FIFTH DISTRICT.—The Twenty-Seventh and Twenty-Eighth Wards, Chicago.

Republican—		
Senate	Theodore R. Steinert	2112 Powell Ave.
	Herman H. Breidt—N. V	3050 N. Hamlin Ave.
	Raymond G. Kimbell	2500 Smalley Ct.
House	Charles L. Fieldstack—F	4016 Syracuse Ave.
	Lewis Hutzler—N. V	2906 Johnston Ave.
S—	Hubert D. Crocker	3947 Irving Park Blvd.

Democratic—
Senate.....Peter McGrath.....2245 Homer St.
S—Peter S. Olson.....2340 Powell Ave.
S—Samuel B. Freud.....2611 Milwaukee Ave.
S—Johan Waage.....3823 N. 43d Ave.
House.....William Hanson.....2457 Moffat St.
Charles McParland.....5011 Grand Ave.
Frank C. Burke.....1621 Milwaukee Ave.
Joseph L. Lisack.....3549 Diversey Ave.
Frank H. Landmesser.....4542 N. 47th Court.
George H. VonHollen.....2014 N. Western Ave.
Chris Jensen.....3834 Sacramento Ave.
Prohibition—
Senate.....Jno E. Larson.....2713 N. Whipple St.
House.....Andrew O. Silversen.....2649 N Central Park Ave.
Socialist—
Senate.....Joseph M. Mason.....3037 N. Spaulding Ave.
House.....lt—Carl Strover.....5642 Higgins Ave.

TWENTY-SIXTH DISTRICT.—The Counties of Ford and McLean.

Republican—
House.....E—W. H. Wright—N.V.....McLean.
S—John A. Montelius—A.....Piper City.
Soren S. Osman.....Gibson City.
Seth S. Noble.....Bloomington.
Democratic—
House.....D. D. Donahue.....Bloomington.
S—Walter E. Spoonts.....LeRoy.
Prohibition—
House.....F. L. Garst.....Stanford.
Socialist—
House.....James M. Bennington.....Bloomington.

TWENTY-SEVENTH DISTRICT.—The Eighteenth Ward and parts of the Sixteenth and Seventeenth Wards, Chicago.

Republican—
Senate.....S—T. B. Scouten.....1438 Madison St.
House.....Leland Berz.....1022 Jackson Blvd.
Albert Rostenkowski.....1261 Noble St.
Democratic—
Senate.....John Broderick—F.....122 Aberdeen St.
Michael F. Sullivan.....21 N. Ashland Blvd.
Joseph F. Helminiak.....1203 Milwaukee Ave.
Scott O. Cavette.....1419 Emma St.
House.....Robert J. Collins.....855 W. Randolph St.
Daniel J. Sullivan.....823 Jackson Blvd.
S—Henry Lynch.....220 Aberdeen St.
Anton J. Onecki.....906 Milwaukee Ave.
Joseph Pitlock.....1308 Crittenden St.
Teofil Weyna.....1020 Milwaukee Ave.
Max Lewandowski.....669 Milwaukee Ave.
William Wreschinsky.....1535 W. Division St.
Salvatore Romano.....816 W. Ohio St.
Prohibition—
Senate.....Charles H. Mortimer.....121 N. May St.
House.....Edward Horth.....1528 Holt Ave.
Socialist—
Senate.....S—Edward Harris.....122 N. Elizabeth St.
House.....Emil A. Hannenberg.....616 W. Madison St.

TWENTY-EIGHTH DISTRICT.—The Counties of DeWitt, Logan and Macon.

Republican—
House.....Edwin C. Perkins—F.....Lincoln.
John R. Robinson—N. V.....Farmer City.
B. R. Behrends.....Hartsburg.
Thomas N. Leavitt.....Maroa.
Democratic—
House.....Moses A. Nickey.....Oakley.
S. J. Woland.....Hartsburg.
S—Edward F. L. Rautenberg.....Lincoln.
S—Willis R. Shaw.....Decatur.
Cyrus J. Tucker.....Warrensburg.
Prohibition—
House.....James S. Stevenson.....Decatur, R. F. D. No. 7.

TWENTY-NINTH DISTRICT.—Parts of the Twenty-First and Twenty-Second Wards, Chicago.

Republican—
Senate.....Samuel E. Erickson.....352 Locust St.
House.....S—Charles A. Nelson.....201 Hill St.
Robert H. McCormick, Jr.....648 Cass St.
S—James F. Burns.....1131 N. Franklin St.

Democratic—			
Senate		John M. O'Connor	1043 Rush St.
	S—	Thomas E. Gavin	820 LaSalle Ave.
		James M. Hayes	149 W. Chicago Ave.
		Thomas Martin	543 Dearborn Ave.
House	S—	John R. Durso	1012 Milton Ave.
	S—	James H. Farrell	1147 Wells St.
	S—	Patrick H. O'Toole	27 W. Ohio St.
	S—	George N. Diederich	229 W. Division St.
	S—	Bernard J. Conlon	444 Lincoln Park Blvd.
	S—	John B. DeVoney	936 Wells St.
		Patrick J. Sullivan—F	210 Whiting St.
		James F. Sullivan	836 Dearborn Ave.
	S—	Chas. E. Steffen	1205 LaSalle Ave.
Prohibition—			
Senate		A. H. Simpson	233 E. Huron St.
		J. C. Pickard	838 N. Clark St.
House		L. F. Jeanmene	233 E. Huron St.
		C. M. Nance	804 Cass St.
Socialist—			
Senate		William Acker	676 LaSalle Ave.
House		T. J. Coveney	659 W. Division St.

THIRTIETH DISTRICT.—The Counties of Brown, Cass, Mason, Menard, Schuyler and Tazewell.

Republican—			
House		Louis Zinger—N. V	Pekin.
		Homer J. Tice	Greenview.
		Thomas F. Edwords	Kilbourne.
Democratic—			
House	S—	Herman W. Danforth	Washington.
		A. M. Foster—F	Rushville.
		Charles J. Skaggs	Pekin.
	S—	Martin W. Greer	Rushville.
	S—	William M. Groves—A	Petersburg.
		John C. Young	Kilbourne.
	S—	John H. Soldwedel	Pekin.
Prohibition—			
House	S—	George W. Warner	Mackinaw.

THIRTY-FIRST DISTRICT.—Parts of the Twenty-First, Twenty-Second, Twenty-Third and Twenty-Fifth Wards, Chicago.

Republican—			
Senate	S—	Willett H. Cornwell	3825 Alta Vista Terrace.
		William A. Burmeister	1521 Larrabee St.
House	S—	Chas. E. Erby	2241 Lincoln Ave.
		Harry L. Shaver	6347 Winthrop Ave.
	S—	Franklin S. Catlin	451 Belden Ave.
Democratic—			
Senate	S—	Simon P. Walsh	2134 Lincoln Pl.
	S—	William P. Ellison	750 W. North Ave.
House		Henry Dophelde	2141 Cleveland Ave.
	S—	Leland P. Smith	2738 Florence Ave.
		John C. Werdell—F	1426 Mohawk St.
		Jacob Levy	1411 LaSalle Ave.
		Charles J. Frank	1456 N. Park Ave.
Prohibition—			
Senate		John H. Hill	822 Crescent Pl.
House		Barton A. Ulrich	726 Bitter Sweet Pl.
		Bengt. J. Regnell	3130 Clifton Ave.
Socialist—			
Senate		Chas. G. Kuhn	1940 Howe St.
House		Wm. Behrens	2208 Sedgwick St.

THIRTY-SECOND DISTRICT.—The Counties of Hancock, McDonough and Warren.

Republican—			
House	S—	Henry Terrill—N. V	Colchester.
		Henry L. Jewell—A	Monmouth.
		I. M. Martin	La Harpe.
Democratic—			
House		John Huston—A	Blandinsville.
	E—	George A. Falder	Colchester.
		David Turnbull	Monmouth.
Prohibition—			
House		William F. Aleshire	Plymouth.
Socialist—			
House		J. Benjamin Edens	Monmouth.

THIRTY-THIRD DISTRICT.—The Counties of Henderson, Mercer and Rock Island.

Republican—
Senate.....Frank A. Landee—N. V.....Moline.
House.....S—Thomas Campbell—F.....Rock Island.
Frank E. Abbey—N. V.....Biggsville.
S—Charles A. Clark.....Sherrard.
Democratic—
House.....Henry L. Wheelan—A.....Rock Island
S—James S. Sloan.....Biggsville
S. Alexander LaVanway.....Rock Island
Prohibition—
Senate.....Robert G. Summers.....Rock Island
House.....Clyde E. Duke.....Rosetta
S—John Marion Fort.....Stronghurst
Socialist—
Senate.....Louis F. Haemer.....Moline
House.....Charles Block.....Rock Island

THIRTY-FOURTH DISTRICT.—The Counties of Clark, Coles and Douglas.

Republican—
House.....D. B. Miller.....Casey
S—William T. Hollenbeck—N. V.....Marshall
S—Guy R. Jones.....Tuscola
S—Carl S. Burgett—A.....Newman
Democratic—
House.....Seymour Hurst.....Marshall
Edward F. Poorman.....Mattoon
Polk B. Briscoe—N. V.....Westfield
S—Marion Watson.....Arthur
Prohibition—
House.....S—Lewis M. Mulliken.....Hindsboro
E—W. H. Emery.....Charleston
Socialist—
House.....Oscar Giese.....Mattoon

THIRTY-FIFTH DISTRICT.—The Counties of Lee, DeKalb and Whiteside.

Republican—
Senate.....S—John H. Gray—A.....Morrison
Adam C. Cliffe—A.....Sycamore
House.....Albert T. Tourtillott.....Dixon
S—Alfred N. Abbott.....Morrison
Andrew A. Bjelland.....Leland
S—Arthur G. Harris.....Dixon
Democratic—
Senate.....Bradford Brinton.....Dixon
House.....W. A. Kannally—F.....Sterling
Burr B. Smiley.....DeKalb
Prohibition—
Senate.....Alexander C. Senska.....Genoa
House.....S—Jacob H. Hoofstitler.....Sterling
George H. Sieben.....Prophetstown
Socialist—
Senate.....N. H. Jensen.....Dixon
House.....S—J. B. Stackpole.....Dixon

THIRTY-SIXTH DISTRICT.—The Counties of Adams, Calhoun, Pike and Scott.

Republican—
House.....George H. Wilson—N. V.....Quincy
S—Jerome O. Christie.....Quincy
Democratic—
House.....S—William H. Hoffman.....Quincy
S—Charles E. Bolin.....Milton
E—Clement L. Hawkins.....Golden
Jacob Groves—A.....Camp Point
S—Sylvester Allen.....Bluffs
Prohibition—
House.....Lucien Cover.....Quincy
Socialist—
House.....James I. Houseweart.....Pittsfield

THIRTY-SEVENTH DISTRICT.—The Counties of Bureau, Henry and Stark.

Republican—
Senate.....H. S. Magill, Jr.....Princeton
B. Frank Baker.....Kewanee
House.....S—Augustus G. Hammond.....Wyoming
S—Clayton C. Pervier—F.....Sheffield
John G. Stewart.....Seatonville
John Robert Moore.....Wethersfield

Democratic—
Senate.....David W. Davis.....Wethersfield
House.....S—Charles E. Mulligan.....Kewanee
S—William J. McGuire—F.....Kewanee
James E. Dabler.....Princeton
Prohibition—
Senate.....O. L. Dayton.....La Moille
J. W. Ross.....Walnut
House.....E. E. Shawl.....Lafayette
Socialist—
Senate.....Patrick Carr.....Ladd
House.....Frank A. Castle.....Kewanee

THIRTY-EIGHTH DISTRICT.—The Counties of Green, Jersey, Macoupin and Montgomery.

Republican—
House.....Frank Rowden.....Jerseyville
Hugh D. Friel.....Benld
S. Elmer Simpson.....Carrollton
David Davis.....Litchfield
John McQuerrey.....Greenfield
David H. Best.....Nokomis
Democratic—
House.....S—Louis P. Daley—N. V.....Carlinville
Stephen D. Canaday.....Hillsboro
George W. Witt.....Kane
J. A. Turner.....Scottville
James P. Kellet.....Witt
S—Adolph Neuber.....Litchfield
John C. Bowman.....Carrollton
Henry A. Shephard—F.....Jerseyville
Prohibition—
House.....E—Robert H. Fullerton.....Carrollton
Socialist—
House.....S—J. J. Keen.....Grafton

THIRTY-NINTH DISTRICT.—County of La Salle.

Republican—
Senate.....Henry W. Johnson.....Ottawa
S—John Wylie.....Utica
House.....William R. Lewis—A.....Grand Ridge
S—William M. Scanlan—A.....Peru
S—George F. Bell.....Lostant
S—Harry C. Barbour.....Ottawa
P. L. Harris.....Meriden
Democratic—
Senate.....George E. Glass.....Streator
House.....Lee O'Neil Browne—N. V.....Ottawa
John J. McCluskey.....Peru
S—Peter Reinhard.....Streator
S—J. Fritchel.....Streator
James G. Doyle.....La Salle
Prohibition—
Senate.....Ralph L. Wylie.....Seneca
House.....J. S. Woodward.....Grand Ridge
Solialist—
Senate.....Ira H. Carpenter.....Streator
House.....Duncan McDonald.....La Salle

FORTIETH DISTRICT.—The Counties of Christian, Cumberland, Fayette and Shelby.

Republican—
House.....S—Walter M. Provine.....Taylorville
Dell D. Brownback—N. V.....Cowden
Theodore J. Cummings.....Vandalia
Charles T. Wade.....Farina
Democratic—
House.....John C. Ricardson—N. V.....Edinburg
S—Francis M. Guinn.....Vandalia
S—Ernest Zimmer.....Neoga
S—Joseph S. Clark—F.....Vandalia
Warren A. Purkiser.....Gays
S—William H. Harp.....Morrisonville
Prohibition—
House.....S—Henry Megeath.....Toledo
William A. Fuson.....Pana
Socialist—
House.....James Haynes.....Pana

FORTY-FIRST DISTRICT.—The Counties of Du Page and Will.

Republican—		
Senate	Richard J. Barr—N. V.	Joliet
	S—John P. F. Conrad	Peotone
House	E—Guy L. Bush—F.	Downers Grove
	S—James H. Alexander	Lockport
	Oliver M. Olson	Wheaton
	William Leimbach	Joliet
	Fred L. Hasenjaeger	Frankfort
	S—Richard Prendergast	Winfield
Democratic—		
Senate	Andrew S. Phelps	Joliet
House	Thomas H. Riley—F.	Joliet
	S—M. F. Hennebry	Wilmington
	S—Bernard L. Kelly	Joliet
Prohibition—		
Senate	John S. Stamm	Downers Grove
House	Frank E. Herrick	Wheaton
Socialist—		
Senate	Frank X. Lasser	Joliet
House	Conrad Lapp	Joliet

FORTY-SECOND DISTRICT.—The Counties of Clay, Clinton, Effingham and Marion.

Republican—		
House	R—J. C. Eisenmayer	Trenton
	S—Erastus D. Telford	Salem
	D. D. Haynie	Salem
	William E. Lown	Dieterich
	Robert S. Jones	Iola
Democratic—		
House	S—Harvey D. McCollum—A	Louisville
	John B. Barnhill	Xenia
	Frank A. Rogers	Salem
	Thomas E. Merritt	Salem
	T. W. Culbertson	Louisville
	S—Fred J. Koch	New Baden
	S—Walter E. Rinehart	Effingham
Prohibition—		
House	S—James F. Rosborough	Centralia
Socialist—		
House	S—Frank Welcher	Beckemeyer

FORTY-THIRD DISTRICT.—The Counties of Fulton and Knox.

Republican—		
Senate	Charles F. Hurburgh—F.	Galesburg
House	Burnett M. Chiperfield—N. V.	Canton
	Edward J. King—A.	Galesburg
	S—W. Scott Edwards	Lewistown
Democratic—		
Senate	L. F. Brown	Galesburg
House	S—J. H. DeWolf—A.	Canton
	L. R. Vandeventer	Glasford
	Stephen A. Hoxworth	Rapatee
	R—W. H. Pankey	Galesburg, R. F. D. 2
	M. P. Rice	Lewiston
Prohibition—		
Senate	Charles W. Williams	Galesburg
House	William M. Horton	Astoria
Socialist—		
Senate	D. M. Baylor	Galesburg
House	James Lord	Farmington

FORTY-FOURTH DISTRICT.—The Counties of Jackson, Monroe, Perry, Randolph and Washington.

Republican—		
House	Dempsey Winthrop	Pinckneyville
	William Stevenson	Tilden
	S—Theodore E. R. Klix	Radom
	S—S. W. McGuire	Sparta
Democratic—		
House	James M. Etherton—A.	Carbondale
	John L. Cox	Murphysboro
	T. M. Gillespie	Lively Grove
Prohibition—		
House	William Quigley	Vergennes
Socialist—		
House	Edward Brown	Murphysboro

FORTY-FIFTH DISTRICT.—The Counties of Morgan and Sangamon.

Republican—			
Senate	S	Logan Hay—N. V	Springfield
		Lawrence L. Flinn	Springfield
House	S	Harry W. Wilson—N. V	Springfield
		Thomas E. Lyon—N.V	Springfield
		Clarence L. McBride	Springfield
	S	Frederick Worth Peden Ishmael	Springfield
	S	Richard E. Fox	Chapin
		William Booth	Springfield
		Edward Houston	Springfield
Democratic—			
Senate		John Peter Mockler	Springfield
	S	Edward L. Merritt	Springfield
		William S. Lurton	Jacksonville
		Elmer A. Perry	Springfield
House		Thomas L. Jarrett	Springfield
	S	James F. Morris—A	Springfield
		Charles McBride	Springfield
		Daniel Bahan	Jacksonville
	S	James M. Bell	Rochester
	S	Robert E. Lee Montgomery	Jacksonville
Prohibition—			
Senate		Henry M. Hart	Auburn
House	S	William C. McCullough	Jacksonville
Socialist—			
Senate		Frank S. O'Neill	Springfield
House		Ralph W. Signaigo	Springfield

FORTY-SIXTH DISTRICT.—The Counties of Jasper, Jefferson, Richland and Wayne.

Republican—			
House	S	George B. Welborn—A	Woodlawn
	S	B. E. Garrison	Wayne City
Democratic—			
House		John M. Rapp	Fairfield
	R	H. Martin Williams	Woodlawn
		John A. MacNeil	Olney
	S	William F. Simmons	Texico
	E	W. Duff Piercy	Mt. Vernon
Prohibition—			
House		Caswell S. Prather	Newton

FORTY-SEVENTH DISTRICT.—The Counties of Bond and Madison.

Republican—			
Senate	S	Edmond Beall	Alton
	S	Frederick E. Tulley	Granite City
House	R	Norman G. Flagg—N. V	Moro
		J. G. Bardill—N. V	Highland
		Louis Ahrens	Wanda
Democratic—			
Senate		Charles W. Terry	Edwardsville
House	S	William B. Thomas	Edwardsville
	S	M. L. Geers	Edwardsville
	S	Jos. F. Long	New Douglas
		James T. Callahan	Alton
		Wm. Dickman	Edwardsville
Prohibition—			
Senate		Rumsey O. Young	Sorento
House		Elijah N. Groce	Upper Alton
Socialist—			
Senate		Hugh Watson	Troy
House		Frank J. Hayes	Collinsville

FORTY-EIGHTH DISTRICT.—The Counties of Crawford, Edwards, Hardin, Lawrence, Wabash and White.

Republican—			
House	S	James A. Watson	Elizabethtown
		D. E. Rose	Maunie
		John A. Logan—N. V	Junction
		Charles O. Harper	Robinson
Democratic—			
House		Charles L. Scott—F	Grayville
		John P. Schumacher	Emma
		William E. Finley—F	Bridgeport
		Emanuel Pyle	Brownsville
Prohibition—			
House	S	J. W. Kilborn	Mt. Carmel
		Wilbur A. Morgan	Bone Gap

FORTY-NINTH DISTRICT.—The County of St. Clair.

Republican—		
Senate	John E. Thomas	Belleville
	E. C. Singers	E. St. Louis
	John M. Chamberlin, Jr	E. St. Louis
House	Eugene Wright	E. St. Louis
	E—H. Lee Gardner	E. St. Louis
	John L. Flannigen—N. V	E. St. Louis
	S—Alonzo A. Miller	Belleville
	Martin Schnipper	Belleville
	S—Charles A. Sherrer	E. St. Louis
Democratic—		
Senate	J. T. W. Rudesill	E. St. Louis
	Fred J. Kern	Belleville
House	James H. Donahue	E. St. Louis
	Dennis J. Foley	E. St. Louis
	S—Charles A. Karch	Belleville
	Frank G. Punch	E. St. Louis
Prohibition—		
House	Edwin W. Walker	Marissa
Socialist—		
Senate	John Wachter	Belleville
House	Adolph F. Germer	Belleville

FIFTIETH DISTRICT.—The Counties of Alexander, Franklin, Pulaski, Union and Williamson.

Republican—		
House	Hall Whiteaker	Mound City
	Frank E. Davis	Cario
	R. D. Kirkpatrick—A	Benton
	Walter D. Parmly	Cobden
	James W. Crawford—F	Benton
Democratic—		
House	Henry G. Carter	Mound City
	L. E. Robertson	Carterville
	Holly R. Buckingham	Alto Pass
	S—Robert P. Hill	Marion
	Fred M. Pool	Herrin
Prohibition—		
House		
Socialist—		
House	Groce Lawrence	Herrin

FIFTY-FIRST DISTRICT.—The Counties of Hamilton, Johnson, Massac, Pope and Saline.

Republican—		
Senate	Douglas W. Helm	Metropolis
House	Elwood Barker	McLeansboro
	G. W. Hill	McLeansboro
	Charles Durfee	Golconda
	John P. Mathis	Vienna
	Joseph Crawford	Belknap
	Pinckney J. Walker	Galatia
Democratic—		
Senate	Warner D. Crouch	Belle Prairie
House	Geo. W. English	Vienna
Prohibition—		
Senate	E. C. Stark	Delwood
House	C. W. Henderhon	Galatia
Socialist—		
Senate	C. B. Titus	Harrisburg
House	C. A. Sullivan	Harrisburg

L. C. TAYLOR, M.D.,
Chairman Legislative Committee, Illinois State Medical Society.

CHAS. J. WHALEN, M.D.,
Chairman Public Relations Committee, Chicago Medical Society.

Special Articles.

FIRST YEAR'S EXPERIENCE OF A COUNTRY DOCTOR.

JOHN H. HOLLISTER, M.D.
CHICAGO.

I think few physicians fail to remember the varied experiences connected with their first year of medical practice. I surely well remember mine.

Not having had the advantages of clinical instruction, for such was not afforded by our medical colleges sixty years ago, I was often thrown upon my own resources in the translation of what I had read in the books and heard in the lecture-room, into actual practice, especially as I often had to prescribe for patients at a distance from home and with no possibility for consultation. During the summer and autumn of 1848 the diseases which I met at Otisco, Mich., were nearly all of the malarial type. Four miles distant, several saw-mills had been recently erected and new lands had been overflowed, and the drawing down of these ponds every day caused malarial exhalations which bred disease in every direction, and beside this, the entire farming region was being rapidly converted into cultivated fields, and the upturning of the virgin soil was an equal menace to the general health. Nearly every home had its invalids and the calls for medical treatment were as numerous as the most ambitious doctor could desire. It was years later that Laveran, of Italy, told us that the plasmodium malariæ was the cause of all this trouble and that quinin would surely kill it. I then only knew that quinin would cure ague, though entirely ignorant of the why, but for practical purposes that was sufficient. For two hundred years it had been known as Jesuit bark, named for its discoverers, then as Peruvian bark, indicating the source of its supply, and a teacupful of the moistened powder was considered as a proper dose. As early as 1830 quinin began to be substituted for bark by those who were able to buy it. As a child I overheard the watchers say they had given twenty grains of quinin the night before to a patient who had died that morning, and that name never escaped me.

Nearly all of the diseases which I was first called to treat yielded so promptly that my reputation as a young practitioner, fresh from the schools, grew in favor as rapidly as I could desire, and I myself began to harbor the impression that I was quite a remarkable physician, and could cure nearly every one that came within my reach. But when the winter came and one after another of my patients, in their anemic condition, dropped away with acute pneumonia, and a severe epidemic of "brain fever," as it was then called, invaded our settlement and took from us a number of our most prominent citizens, both old and young, I was not long in coming down from my high perch and began to doubt whether I could cure anybody.

During the summer I had been associated with an old friend who had now gone to Cleveland to attend a second course of lectures and obtain a diploma, and I had the whole field to myself, save as I could summon counsel from Ionia, seventeen miles distant. Still keeping my counsels well to myself I was able to hold my footing, and much to my surprise the people had more confidence in me than I had in myself. I surely served them the best I knew and was grateful for their fidelity. I have since been engaged in practice over sixty years and during that period have treated many thousands of patients, but never since have I been so elated as during that first summer, nor so distrustful of myself as during that first winter. In looking back over this long period, I flatter myself that the vast majority of my patients were hastened back to health through my agency. Just how many recovered in spite of it I have never been able to determine. But I pass on to say that the young physician in the city, who can at once summon the help of an able consultant and with him divide the responsibility in the treatment of critical cases knows nothing of the trying ordeal which confronts the country doctor, and yet, what remarkable records many of these have made. Everyone cherishes a tender regard for the heroism of Dr. Ephraim Macdowell, who in that little hamlet of Danville, Ky., single handed and alone, performed the first ovariotomy of which there is any record in the annals of surgery. It was Sims who fought his way from the rounds of a country practice to one of the foremost positions in the world as a gynecologist. It was Jenner, a country practitioner, who gave us vaccine. It was Williams, who from being a country doctor, became the foremost pathologist of his time in England, and thus the list could be almost indefinitely extended of those who rose to eminence from country homes. Not a word of disparagement for those who have every advantage of clinical instruction and have at command able consultants, but the real fibre of the man is wrought out in the country doctor. During my first year I had quite an extended obstetrical practice, which sometimes put me extremely upon my metal, and my later experience has given me the conviction that I was wise in not being over officious for the sake of gaining time.

A country physician twenty miles from home, in the selection of remedies, is limited to the contents of his saddle-bags, and a doctor called that distance is expected to *do* something if he charges for his visit. I was thus called and must meet the expectation of the whole neighborhood. The case was that of a little boy, bitten by a venomous snake. In all that region whiskey was the popular remedy for snake-bites, and of course I prescribed whiskey, and the old fellows of the neighborhood, who were familiar with that article, heartily endorsed my prescription and allowed that that young doctor was up to date on snakes. But it occurred to me that something more must be done, since I had come twenty miles and the neighbors could have made that prescription without my help. So I ransacked my brain to select something from my saddle-bags a little above their comprehension. It was purely a matter of accident, but I hit upon a bottle of aqua ammonia and sweet oil. Its repeated application would give them something to do,

which I deemed important and then the fumes of the ammonia would convince them that it was "mighty powerful." That snake-bite gave me the business of that neighborhood. But the real point is this: The *London Lancet,* some thirty years later, quoted at length an article from an East India journal, advocating both the external and internal use of ammonia as one of the most serviceable remedies in the treatment of snake-bites. I prescribed better than I knew.

Sixty years have passed since that time. I have passed through many and varied experiences in a city numbering, when I came, 40,000, and now over 2,000,000 of inhabitants, and have been conversant with city practice, hospitals, and medical teaching but in all this time, amid all these pleasant memories, I have never forgotten my crude and sometimes amusing experiences, during my first year as a country doctor.

BACTEREMIA WITH SPECIAL REFERENCE TO ENDOCARDITIS.*

E. C. Rosenow, M.D.
CHICAGO.

The bacteriologic study of the blood in recent years has thrown much light upon the nature of the infectious diseases, has made the treatment more rational, and has earned a valuable place as a routine diagnostic test. The technic is simple and the discomfort to the patient trivial. It is not the purpose of this paper to review the voluminous literature nor to discuss questions of purely scientific interest, but rather to point out some of the more important practical bearings of this highly important topic.

The value of early blood cultures in typhoid fever is greater than any of the other diagnostic tests. Positive cultures are obtained by various investigators in from 75 to 90 per cent. of the cases. Similar results are obtained in paratyphoid infections. The finding of the bacterium in the blood in these cases is the best means of arriving at a positive diagnosis. The presence of pneumococci in the blood in lobar pneumonia is well recognized. Early in the attack (up to 4 or 5 days) the cultures are positive quite as often in the fatal and non-fatal cases. While late in the disease, other things being equal, the finding of the pneumococci in the blood indicates a bad, although not necessarily a fatal, prognosis. The presence of pneumococci in the blood in broncho-pneumonia, ether pneumonia and pneumonia of infancy and childhood, is so uncommon that blood cultures are only occasionally of diagnostic value. The demonstration of influenza bacilli in the blood in influenza, and the meningococcus in epidemic cerebrospinal meningitis, is so difficult that this procedure can not be recommended for routine work. Blood cultures in the acute endocarditis of rheumatism and in the cases of simple endocarditis of chorea and those following tonsillitis are uniformly negative, notwithstanding the fact

* Read at the Sixtieth Annual Meeting of the Illinois State Medical Society, at Danville, May 19, 1910.

that at least a transient bacteremia must necessarily have been present. Early in tonsillitis, acute osteomyelitis, otitis, puerperal sepsis, and other acute pyogenic infections, it is not uncommon to find streptococci, pneumococci, and less often staphylococci in the blood. Subsequent cultures are usually negative and if so are a favorable sign. If, however, the infection has caused thrombosis of the larger vessels, the cultures are usually positive and indicate a grave prognosis. The early proximal ligation of the thrombosed vessel when possible, as has been suggested by some, would seem to be a rational procedure, and in a number of reported cases, seemed to cause the disappearance of the organisms from the blood and recovery of the patient. How can we differentiate between bacteremia with (endocarditis) and bacteremia without (septicemia) localization on the endocardium? This is of especial importance because of the recent reports of the prompt alleged cures of cases of endocarditis by means of vaccine therapy.

As just pointed out, even the continued presence of bacteria in the blood does not prove that the heart valves are involved. The development of an accidental cardiac murmur, which cannot clearly be differentiated from those due to organic valvular disease during the course of a severe infection, is not very uncommon. The appearance of the murmur in endocarditis may be much delayed. Petechial hemorrhages even may occur without localization on the heart valve. Hence the greatest care must be exercised before conclusions can be drawn in these conditions. The clinical picture in acute endocarditis is so typical that there is usually little difficulty in arriving at a correct diagnosis. The micro-organisms isolated in these cases present no special features. The differentiation, on the contrary, of the cases of endocarditis which run a more chronic course and which practically always attack previously injured valves from other septic infections, on clinical grounds, is often impossible until very late in the disease. The isolation and study of the infecting micro-organisms in these cases should always be done, because it affords the best evidence upon which an early diagnosis can be made. The micro-organisms show features which are in a large measure characteristic of endocarditis and more particularly of the malignant tendency of the infection. From my studies on endocarditis it appears that the clinical course, the character of the lesion on the valves, whether vegetative or ulcerative, and the other pathologic findings in endocarditis, depend more than has been thought in the past, on the degree of virulence of the infecting micro-organism than on the kind of bacteria in question. Thus in acute pneumococcus endocarditis which follows pneumonia or osteomyelitis, the organisms are highly virulent and present no characteristic features.

In chronic pneumococcus endocarditis,[1] on the other hand, the cocci show varying degrees of modification, depending upon the length of the clinical course. The characteristics which strongly suggest endocarditis are briefly these: the organisms produce a smaller amount of green in

1. The reasons for believing that the organisms which are isolated in the vast majority of these cases by all observers are modified pneumococci, are shown in the Jour. of Infectious Diseases, Chicago, Vols. vi, 1909, and vii, 1910.

blood agar plates than ordinary pneumococci, the colonies adhere more or less tightly to the surface of agar slants, grow in clumps in broth, and the fibrin clot which forms in broth to which the blood is added, leaves a clear fluid. They are Gram positive diplococci, often in long chains, are freely susceptible to phagocytosis, and are of very low grade of virulence to animals. Analogous observations were made in a case of staphylococcus endocarditis.

While blood cultures are of great value in the identification of these conditions, it should be remembered that the same holds true here as applied to laboratory methods generally, viz., the results should always be interpreted and studied in the light of the general clinical picture, and should serve not to minimize the value of thorough clinical study of the patient, but to make the latter more rational and conclusive. Brief abstracts of a number of more unusual cases will serve to illustrate the great value of cultures as a routine measure in diagnosis of more obscure infections.

CASE 1. Streptococcemia with septic temperature following an attack of tonsillitis in a middle aged man with an old mitral insufficiency, due to endocarditis following rheumatism; mitral systolic murmur, which changed noticeably in quality. Spleen palpable, slightly tender; leucocytosis, 18,000; several subcutaneous hemorrhages; pure culture streptococcus pyogenes isolated from blood. Diagnosis of acute streptococcus endocarditis was made and a fatal prognosis predicted. The patient made an uneventful recovery. This would have been a brilliant example of a cure of endocarditis from vaccine therapy, had the injections been given. It was undoubtedly a case of streptococcemia without localization on the heart valves.

CASE 2. Puerperal sepsis in a middle aged woman who during her prolonged illness developed a mitral murmur with moderate dilatation of the heart. Pure culture of streptococcus pyogenes early in the course of the disease. Two weeks later the culture was negative and recovery slowly occurred without special treatment.

CASE 3. An attack in a young woman closely resembling acute appendicitis. Appendectomy performed thirty-six hours after beginning of symptoms. There was found a moderately swollen appendix with several small ulcers of the mucous membrane, together with a chain of acutely enlarged mesenteric lymph glands which drained the appendix. The picture suggested typhoid fever, a blood culture yielded a pure culture of paratyphoid bacillus. The patient made an unusually prompt recovery. The infection clearly began in the appendix and it appeared that its early removal shortened the attack.

CASE 4. Puerperal sepsis associated with extensive thrombosis of the left jugular and brachial veins. Blood culture yielded a pneumococcus of low virulence. The development of a soft blowing murmur over base of the heart suggested an endocarditis, but the patient made an uninterrupted recovery.

CASE 5. Influenza in an elderly lady with an abrupt onset, leucocytosis 10,500, marked prostration, intense backache, temperature 102.5°. Ten c.c. of blood were planted into the usual media, including ascites broth. In the latter there developed a pure culture of influenza bacilli. Recovery took place in the usual manner.

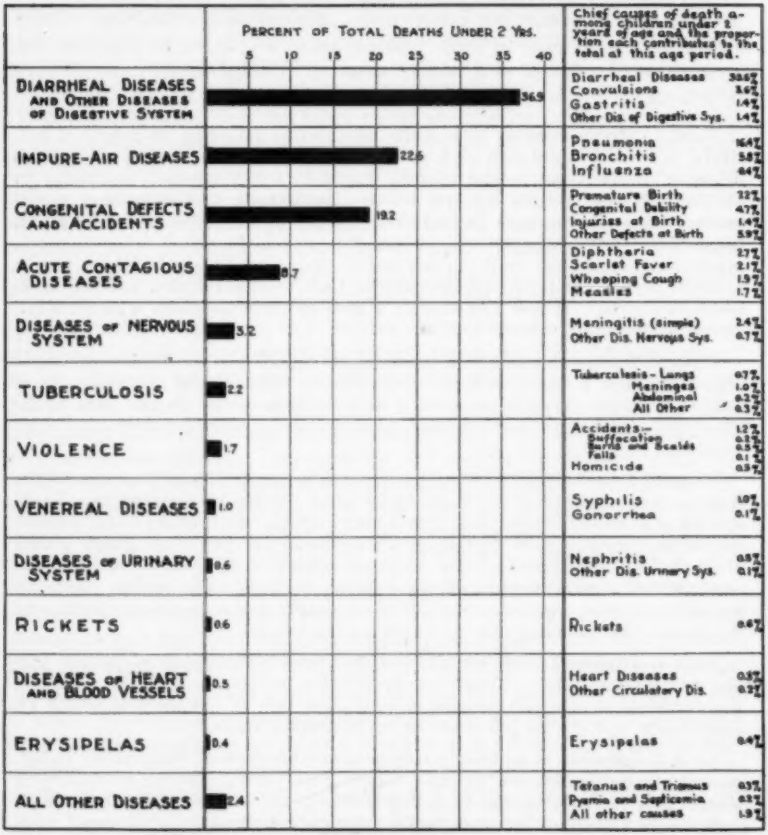
CASE 6. Acute follicular tonsillitis, pure culture of streptococcus pyogenes obtained from the blood during the initial chill. The culture, on the following day was sterile. The patient recovered in the usual manner.

WHAT KILLS THE BABIES

THIS DIAGRAM SHOWS THE CHIEF CAUSES OF DEATH AMONG CHILDREN UNDER TWO YEARS OF AGE AND THE RATIO OF EACH CAUSE TO THE TOTAL DEATHS IN THIS AGE DIVISION.

In each 100 deaths among children under 2 years of age 37 are caused by diseases of the digestive system; 23 by the impure-air diseases; 19 by defects and accidents at birth; 9 by acute contagious diseases; 3 by diseases of the nervous system; 2 by tuberculosis; 2 by violence; 1 by venereal diseases; etc.

70 PERCENT OF SUCH DEATHS CAN BE AVOIDED – WITH PROPER CARE



Chief causes of death among children under 2 years of age and the proportion each contributes to the total at this age period.	
Diarrheal Diseases	32.8%
Convulsions	3.6%
Gastritis	1.4%
Other Dis. of Digestive Sys.	1.4%
Pneumonia	16.4%
Bronchitis	5.8%
Influenza	0.4%
Premature Birth	7.2%
Congenital Debility	4.7%
Injuries at Birth	1.4%
Other Defects at Birth	5.9%
Diphtheria	2.7%
Scarlet Fever	2.1%
Whooping Cough	1.3%
Measles	1.7%
Meningitis (simple)	2.4%
Other Dis. Nervous Sys.	0.7%
Tuberculosis - Lungs	0.7%
Meninges	1.0%
Abdominal	0.3%
All Other	0.2%
Accidents—	1.2%
Suffocation	0.2%
Burns and Scalds	0.2%
Falls	0.1%
Homicide	0.2%
Syphilis	1.0%
Gonorrhea	0.1%
Nephritis	0.5%
Other Dis. Urinary Sys.	0.1%
Rickets	0.6%
Heart Diseases	0.3%
Other Circulatory Dis.	0.2%
Erysipelas	0.4%
Tetanus and Trismus	0.2%
Pyemia and Septicemia	0.2%
All other causes	1.9%

DEPARTMENT OF HEALTH,
CHICAGO.
Popular Education Series
No. 5

COUNTY AND DISTRICT SOCIETIES.

COOK COUNTY.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting held May 17, 1910.

President, Dr. George E. Shambaugh, in the Chair.

SARCOMA OF THE NASAL WALL OF THE MAXILLARY ANTRUM.

O. T. Freer, M.D.

In August, 1908, the patient, then a woman aged 40 years, noticed an increasing obstruction in the left nostril. The occlusion soon became complete and was associated with repeated severe nose bleed, and when I first saw her in December, 1908, the condition was associated with an intensely fetid breath. Inspection of the naris showed it apparently filled with mucous polypi, but when the anterior ones of these were removed a deep pink lobulated growth appeared farther back in the nostril, which bled when touched. By posterior rhinoscopy the nasopharynx was seen to be quite filled by a gray sloughing tumor, which proved to be the source of the stench. The intranasal growth and its postnasal extension were removed with the pernasal forceps I employ for taking away adenoid vegetations through the nose and which I have described in the Annals of Otology for 1906.

While the removal of the growth produced severe hemorrhage, it could be taken away so rapidly with this forceps, including the postnasal mass, that the total loss of blood was not great, for as soon as the healthy base of the tumor was reached the bleeding ceased. It would have been impossible to work as quickly or thoroughly with postnasal forceps as with the pernasal ones, or as intelligently, for the use of the index finger as a guide in the nasopharynx accurately led the pernasal forceps to the portions of the neoplasm which it grasped. In addition the pernasal forceps was employed to clear out the interior of the naris as well as the nasopharynx, so that this one instrument served for the whole procedure.

It was found that all of the turbinated bodies and the ethmoid cells upon the affected side had disappeared by absorption and softening into the growth, so that the completion of the operation left the left naris a large cavity.

Within a few weeks the tumor returned in the nasal wall of the antrum and this too had to be removed in a second operation, so that the maxillary antrum became one cavity with the nasal fossa. There were other minor relapses, so that six operations in all were needed, the last recurrence appearing in the outer wall of the antrum and being cleaned off with the Gruenwald nasal curettes, the Gruenwald punch, and the Rhodes tonsil punch.

Since this last removal, in September, 1909, there has been no return of the neoplasm and the woman has remained in perfect health.

In all of the operations large portions of the growth were found necrotic, a condition evidently due to a tendency of the tumor to shut off its own circulation by degeneration of its vessels. Repeated microtome sections were made which also showed extensive necrosed areas, so that it was difficult to find enough living tissue for a histologic diagnosis. This was finally made for me, through the kindness of Dr. George Shambaugh, in the laboratories of the University of Chicago, the conclusion reached being that the tumor was a mixed sarcoma, mainly of the round celled type, with some spindle cells.

The tendency to rapid degeneration of some sarcomas is well known and is shown by the influence of erysipelas in causing degeneration and absorption of these growths.

The history of this case shows that the rapid removal of a nasal sarcoma with the pernasal forceps makes the bleeding negligible, as it will be sure to be arrested when the base of the growth is reached.

There is no doubt that the general surgeon would have attempted to remove this tumor by approaching it from without by a resection of the upper jaw and the favorable result in this case is another proof that rhinology can accomplish intranasally at least as much as can be done by such formidable procedures.

It is only in exceptional instances, where a round-celled sarcoma is not of the most malignant type, that such a favorable result, as that obtained in this case, may be expected. A number of other intranasal sarcomas I have seen, and which originated in the same locality in the nose, were so exceedingly malignant and recurred so rapidly that they were perfectly uncontrollable. As is well known, the variation in the malignancy of sarcomas is far greater than in carcinoma.

DISCUSSION.

Dr. E. Fletcher Ingals:—I have seen a number of cases of this kind, but none of the patients recovered; however, a case of recurrent fibrosarcoma that did recover, is of interest. The patient was about fourteen years old when I first saw him. The late Dr. Gunn attempted to remove a part of the growth, which had extended into the zygomatic region, but there was so much hemorrhage that he closed the incision without doing anything further. I removed the growth from the naso-pharynx and naris two or three times during as many years. Then he disappeared for a number of years. When he was twenty-seven years old he called to see me and I found that the tumor had entirely disappeared, leaving a large cavity about the size of a hen's egg in the back part of his nose.

Dr. C. M. Robertson recalls a case of angioma sarcoma in a man 45 years old where the left naris was occluded by a mass which protruded. It bled very freely. The antrum was filled with the growth and it had perforated into the orbit causing exophthalmos. On account of the severe pain and the hemorrhage which occurred several times a day, and on account of the severe stench, he removed as much as possible with the punch forceps. The exophthalmos disappeared with the disappearance of the tumor. The patient was well three years later and has not been seen since. In another patient 27 years old, with a fibrosarcoma, Dr. Senn had removed the entire septum and external wall of each nostril. When seen the patient had a growth in the nose which felt and cut much like soft rubber. The hemorrhage was profuse. He made several efforts to encircle the tumor—which appeared to hang from the cribriform plate—with a snare, but without success. The patient disappeared from observation. There is a difference in malignancy between the various sarcomas which involve the nose. Some disappear spontaneously. It is sometimes impossible to make a distinction between a myxoma, a fibroma, and a myxosarcoma. He believes that Dr. Freer's case is one of myxosarcoma. In angioma the hemorrhage is most alarming at first but as one nears the base of the tumor the hemorrhage stops.

Dr. J. Holinger emphasized the value of the symptom of stench in these cases, which is not especially emphasized in text-books.

Dr. F. I. Brown saw in a man aged 40 years a sarcoma springing from the inferior turbinated body, right side. The tumor was a typical spindle-celled sarcoma. After its removal there was a rapid recurrence. After the second operation the patient was given six α-ray treatments. There has been no recurrence. The characteristic stench was present in this case.

Dr. J. C. Beck has seen several cases of sarcoma involving the nose. One was a case of fibro-sarcoma with necrotic area. The patient was operated upon by resection of the superior maxillary bone. The tumor recurred but subsequently under large doses of potassium iodid the patient made a complete recovery. Syphilis in some cases is difficult to diagnose from sarcoma. Nasal sarcomas are often slow growing. This has been emphasized recently by Dr. Welsh. The stench which is complained of in almost all of the cases is undoubtedly the

result of necrosis. He has seen two cases of fibro-sarcoma in which a temporary resection was done with no recurrence.

Dr. Freer (closing the discussion) emphasized the attitude of the general surgeon to these intra-nasal sarcomas. There is little doubt but that every one of the cases mentioned here this evening would have been subjected by the general surgeon to a resection of the upper jaw or some other mutilating operation. The general surgeon takes the attitude that nothing in the nose can be attacked successfully without removing half of the face. Dr. Freer has seen cases operated on by the general surgeon where the entire hard palate was lowered in order to get access to the nasopharynx. The patient died on the table. Any expert rhinologist would have removed the growth intra-nasally. Of course an extremely malignant tumor operated on intra-nasally without success would give rise to the doubt whether the radical external operation might not have been more successful. As a matter of fact these malignant sarcomas will recur no matter what is done. The other sarcoma can be removed intra-nasally with recovery.

SURGERY OF THE MIDDLE TURBINATE.

A. H. Andrews, M.D.

Dr. Andrews divides the abnormalities of the middle turbinate that may call for surgical interference into two classes. First, conditions of the middle turbinate itself; second, of the surrounding structures. He believes that the turbinate may lie too close to the outer wall and interfere with the drainage from frontal sinuses, anterior ethmoid cells and maxillary sinuses. He believes that where it does not seem to interfere with drainage it may still be a source of irritation and reflex disturbance by pressing upon the septum by extending to the inferior turbinate. Of the abnormalities of the neighboring structures which may necessitate the removal of this structure he includes the following: Deflexion of the septum and enlarged bulla of the ethmoid. Among the commoner diseased conditions which are generally recognized as calling for removal of the turbinate are:

1. Polypi springing from or recurring in the immediate neighborhood of the turbinate.

2. Chronic disease of any of the anterior group of accessory cavities especially when the turbinate itself is diseased or when it lies so close to the lateral wall as to interfere with drainage, ventilation or with examination of these cavities.

3. Disease of the sphenoid sinus or posterior ethmoid cells when it may be necessary to remove the middle turbinate in order to facilitate the treatment of these cavities.

Among the conditions regarding the treatment of which there is considerable difference of opinion may be mentioned:

1. Pressure between the middle turbinate and some of the surrounding structures especially when associated with headache or pain in the eyes not otherwise accounted for.

2. A persistently red and inflamed or hypertrophied turbinate especially when the other parts of the nasal cavity appear normal. This condition is frequently associated with the same class of head and eye symptoms.

3. A large and inflamed turbinate, probably of the bullous variety, without reflex symptoms.

4. The persistent appearance of a purulent or mucopurulent discharge under the turbinate the source of which cannot be located.

5. When the turbinate is pressed upon by a small circumscribed deflection of the septum with plenty of room below for the passage of air.

6. A sensation of nasal obstruction when there is plenty of breathing space below but the middle turbinate occludes the upper air passage.

7. Atrophic rhinitis affecting the lower part of the nose with an enlarged and inflamed middle turbinate.

In the older text books little space is given to the surgery of this body. In the later text books and in recent journal articles the subject has been quite fully discussed. Of the instruments devised for the removal of the turbinate the Gruenwald forcep is perhaps the best known. Holmes' scissors have been extensively used but are thick and clumsy especially for use in a narrow nose. A number of operations on the middle turbinate other than turbinotomy and turbinectomy have been proposed. Cauterization has had its advocates but it seems to have been almost abandoned. Crushing of the turbinate in the cystic variety has been tried, and while it may have relieved pressure in some cases it has been followed by inflammatory conditions which later necessitated removal. At the present time the surgical aspect of these cases seems to have been narrowed down to the question of turbinectomy, turbinotomy or letting the turbinate alone.

Dr. Andrews demonstrated a chisel with a cutting edge between two guarded points, curved so as to follow the attachment of the turbinate while cutting, which he believes makes the turbinectomy much easier.

DISCUSSION.

Dr. F. G. Stubbs:—The middle turbinate is one of the most important structures in the nose. It is probable that it would come in for a greater share of operative interference if there was a more general recognition of the fact that the current of inspired air may be obstructed more by enlargement of this structure than from enlargement of the inferior turbinated body. Whether the removal of the middle turbinate increases the liability of infection in the accessory sinuses is still an unsettled question. He doubts whether it acts as a protection to these sinuses. Dr. Stubbs has found the chisel devised by Andrews much more suitable for the removal of the middle turbinate than the older methods. In using the snare he differs with Dr. Andrews in that he believes the best results are attainable not by placing the loop of the snare above the anterior end but by placing it on the inferior surface.

Dr. George E. Shambaugh has not used the chisel devised by Dr. Andrews but believes that it will make the removal of the middle turbinate easier than by our older methods although, as a rule, not much difficulty is encountered by the methods which we now use. He believes we can do less harm to a patient by removing the middle turbinate than by removing the inferior. In inflammation of the anterior group of accessory sinuses where the process persists, it is a great assistance to have the middle turbinate removed. He believes that in giving a list of indications for the removing of a structure like the middle turbinate such as Dr. Andrews has given in his paper, it is often advisable to point out the contraindications. He believes that while it is advisable to remove the middle turbinate occasionally for each one of the indications suggested by Dr. Andrews, it is nevertheless true that in many cases presenting just these conditions the middle turbinate should not be removed. For example, the middle turbinate exists under a variety of different forms and a beginner in reading over a list of indications for its removal such as given in Dr. Andrews' paper might, it seems, readily make the mistake of persuading himself that almost any turbinate presenting an ordinary anatomical variation should be subjected to an operation.

We are all aware that the country is being crowded just now with men whose preparation for practice in these special fields is not such as to make them capable judges of whether operations in the nose should or should not be done. Ofttimes about the only knowledge which some of these men seem to think it is necessary to acquire before undertaking special work is to become familiar with the different instruments that are used for operations in the nose without any appreciation of the pathology of the various nasal diseases.

Dr. C. M. Robertson:—The middle turbinate may be red and swollen in cases of polypi in the middle meatus without the turbinate itself being hypertrophied. He has been trying the effect of lavage of the maxillary sinuses in cases of persistent swelling of the middle turbinate and has found the result very satisfactory, indicating that a diseased condition of the maxillary sinuses causes the swelling of the turbinate. Where the bulla ethmoidalis is enlarged this should be broken down before operation upon the turbinate. Where the middle turbinate touches the inferior the removal of a strip along the lower border is sufficient. One should always aim to save as much of the turbinate as possible. This instrument presented by Dr. Andrews will not be serviceable in all cases. Dr. Robinson has seen cases where the size of the bullous enlargement would make it impossible to use the chisel. He has seen cases where the cystic degeneration of this body has progressed until enclosed sacs were formed between the lateral wall and this body. Dr. Sluder of St. Louis has designed a knife which can be slipped under the turbinate and cuts the turbinate off by pulling it forward.

Dr. R. H. Good cautioned against pressing downward when cutting off the middle turbinate body with Andrews' chisel except where it is desired to remove the entire body.

Dr. J. R. Fletcher was pleased to hear the word of caution by Dr. Shambaugh regarding the removal of the turbinates. The physiologic importance of these structures can be surmised when we remember that in twenty-four hours they furnish ½ liter of water to moisten the inspired air. The indications given by Dr. Andrews are doubtless correct but we must be certain that the symptoms exist which warrant the removal of this body when these conditions are present.

He recalled a case where the inferior turbinate was much too large, causing an obstruction to the inspired air. This condition has adjusted itself, which shows that it was in a large measure a vaso-motor disturbance. He thinks it is immaterial whether we operate with a snare loop placed above or below, as it can be successfully removed either way. The important thing to remember is that we may cause permanent injury by removing too much of these structures. Rhinitis sicca often develops a year or two after removal of the middle turbinate.

Dr. Andrews (closing the discussion) stated that he had no doubt that the middle turbinate has the function of preventing infection of the accessory sinuses, and that in cases where the removal of the middle turbinate was followed later by disease of the antrum that the antrum trouble was the result of lack of protection. He has found polypi extending from diseased cavities in the turbinate body. It is impossible to determine what polypi found in the middle meatus comes from the turbinate itself and what from the lateral wall of the meatus. He believes that a considerable proportion comes from the turbinate body. He has never seen a middle turbinate on a cadaver or on the living that he was unable to remove with his chisel.

ARE DISEASES OF THE MIDDLE EAR ALWAYS DEPENDENT ON NASO-PHARYNGEAL DISTURBANCE?

HENRY GRADLE, M.D.

DISCUSSION.

George E. Shambaugh:—The point of view advanced by Dr. Gradle has much in its favor. Inflammatory conditions of the middle ear resemble closely similar involvements of the nasal accessory sinuses. Infection of these sinuses almost without exception have their origin in intra-nasal diseases and the same also is true for disease of the middle ear. Granting that inflammatory diseases of the middle ear have their origin in conditions in the naso-pharynx, another question of great importance presents itself; this is the question of how far we may expect to be able to improve diseases of the middle ear by looking after abnormal conditions in the nose and throat. As Dr. Gradle has well expressed it, intra-

nasal surgery has received one of its greatest stimuli from the otologist. The otologist, recognizing the fact that middle ear diseases have originated in the naso-pharynx has been in the habit of referring his cases to the rhinologist with the request to correct any abnormal conditions found in these parts. The rhinologist has often been led to proceed with the removal of any anatomical variation that may be found in the nose in the hope that this may influence the middle ear condition. This has unquestionably led to a very large amount of unnecessary work in the nose and throat, with the mistaken impression that chronic middle ear conditions could in this way be improved. A more correct view of the situation in chronic adhesive middle ear catarrh can be gained perhaps by comparing this situation with that arising from chronic suppurative otitis media. In the latter case we are quite willing to admit that the suppuration was originally the result of an extension from disease of the naso-pharynx. No one would expect to improve the defect in the hearing in a case of chronic suppuration by operations upon the nose or throat.

Cases of chronic tubo-tympanic catarrh often have their origin in the same kind of an acute process that starts the suppuration of the middle ear. The discovery in these cases later in life of anatomical variations in the nose, such as a deviation of the septum, should not lead us to hold this responsible for the middle ear condition, nor have we any right to expect that the correction of these anatomical variations would influence in any way the middle ear process. Entirely too much stress has been put on the supposed relation existing between conditions in the nose, such as here referred to, and chronic middle ear processes. If we find in the examination of an ear case a nasal obstruction which is actually interfering with the proper nasal respiration it is of course our duty to advise to have this corrected; not, however, for the improvement of the ear. It is doubtful whether any of these intra-nasal operations influence in any way the progress of a chronic middle ear condition.

A CASE OF CHRONIC PROGRESSIVE BULBAR PARALYSIS.

R. H. Good, M.D.

Mrs. R. M. G., from Arizona, widow, aged 50 years, came to my office, Nov. 10, 1909, with the following history: During August, 1909, she began to have some difficulty in speech and became easily fatigued on using her voice at length. She also complained of a feeling of fullness and difficulty in swallowing and breathing.

Her condition gradually became worse and on Nov. 19, 1909, she reported as follows: Always enjoyed perfect health, has had no children and no miscarriages; family history negative. At this time she could not articulate distinctly, yet one could understand what she was saying. There was some difficulty in breathing, becoming readily fatigued on using the voice. Liquids would occasionally pass into the nose on swallowing. She had coughing spells when swallowing solid food. The lips could not constantly be kept closed so that there was a dribbling of saliva.

On examination the mouth appeared large and the lips thinner than normal. The tongue could be protruded with difficulty, the surface showed folds or depressions and there was a constant tremor of the muscles of the tongue. The patient could not lift her tongue up to the hard palate. The senses of taste, touch and pharyngeal reflex were present. The soft palate moved sluggishly; the larynx appeared normal but the muscular movements seemed to be impaired. The deltoid muscle as well as the muscles of the hand were weakened. The thenar and the hypothenar eminences were flabby and flattened and the intercarpal muscles showed signs of atrophy.

The reflexes of the arms and legs were somewhat exaggerated. Sphincters not disturbed. Patient has had a chronic catarrhal otitis media for the past fifteen years but has observed no special progress during the past year. Vision normal and fundus findings negative.

Cerebration normal. Nerves involved were facial, hypoglossal, glosso-pharyngeal, pneumogastric, and the upper spinal, all of which have their motor nuclei in the medulla and anterior horns of the spinal cord.

The patient has gradually become worse until at the present time she is unable to take solid food and even has choking and coughing spells when swallowing liquids. Her breathing is labored and she frequently wakes up during the night with smothering sensations. The intensity of her voice is diminished, the pitch lowered and her articulation cannot be understood.

The onset of the disease was gradual and the involvement bilateral and the disease slowly progressive. No symptoms of brain tumor. Wassermann negative. Potassium iodid of no benefit, so that we have here a clear case of degeneration of the motor nuclei in the medulla.

DISCUSSION.

Dr. J. C. Beck saw the case with Dr. Good in March and thought it a case of progressive muscular atrophy. The Wassermann test is not affected by the administration of potassium iodid.

Dr. A. Heym has studied this case and considers it one of progressive bulbar paralysis; a rare disease occurring about the age of fifty with a doubtful etiology. The lesion in this case is not confined to the medulla but has extended to the spine. There is an atrophic condition of the upper extremities. Patellar reflexes are somewhat increased and on one side there is a slight ankle clonus. There is no Babinsky. This increase in reflexes indicates that the process is extending to the spine. Bulbar paralysis is frequently the final step of some spinal diseases. The spinal form of progressive muscular atrophy begins in the upper extremities and later passes to the medulla. This case is connected with amyotrophic lateral sclerosis. The interesting feature here is that the bulbar symptoms developed first and the process later extended downwards instead of the reverse as is the rule. The electrical tests show the reactions of degeneration of the muscles of the arm and hand but not in the face. The entire nervous mechanism is not yet entirely degenerated in any part. There is still some function in every group of muscles. Pathologically the process is an infection of the medulla. The motor nuclei of the facial nerve, the glosso-pharyngeus, the vagus, and the spinal accessory are involved. There is atrophy of muscles without evidences of inflammation. Slowly progressing condition excludes hemorrhage. Tumor is excluded by the absence of tumor symptoms, choked discs, etc. The prognosis is bad. The duration as a rule is from one to three years. Patients die from paralysis of the heart when the atrophic condition finally attacks the motor nucleus of the vagus.

PAPILLOMA OF THE LARYNX COMBINED WITH OPEN FORAMEN OVALE IN THE HEART.

Reported by J. HOLINGER, M.D.

The coincidence of papilloma of the larynx of children with a patent foramen ovale in the heart has been repeatedly described and always proved fatal. These children from their birth are much more cyanotic than the papilloma would lead us to expect.

Report of case: child, aged 3 years, breathes very laboriously. Intubation and direct laryngoscopy failed. Tracheotomy brought relief, but the child died after three days. Post-mortem besides papilloma of the larynx, shows emphysema, highest tracheitis, and bronchitis, open foramen in the heart. The failure of intubation and direct laryngoscopy was due to two very short glosso-epiglottic bands, which caused the entrance of the larynx to contract to a slit as soon as the tongue was pushed forward.

A CASE OF RECOVERY FROM GENERAL PURULENT MENINGITIS.

A woman aged 28 years had acute otitis media. A few days later all the symptoms of a general meningitis, sleeplessness, severe headache, stiffness of the neck, brain-pulse. The large perforation was in Shrapnell's membrane, and the purulent secretion came directly from above. The diagnosis was purulent meningitis following acute purulent otitis. An operation was refused, therefore aspiration according to Professor Bier was applied. After three weeks all symptoms had disappeared and she attended to her household as usual. Seven months later again otitis media, two days later meningitis, death after four more days. The post-mortem shows the acute general meningitis and encephalitis. Over the tegmen tympani the dura, pia and brain are adherent in one mass to an opening in the bone. Old grayish streaks were found over the base and large parts of the convexity of the pia, showing the large extent of the meningitis seven months previous.

DISCUSSION.

Dr. N. H. Pierce does not see how this case can be accepted as a proof that purulent meningitis ever recovers. The fact that the patient died supports the contention that cases with purulent meningitis always succumb. The case is one of intermittent meningitis. This condition originating in a suppurative ear disease may develop a dozen or more attacks before the condition terminates fatally, and unless an operation is performed the majority of them eventually die from a general purulent meningitis. The death occurs because of the extension into the cortex producing an encephalitis. Cases of serous meningitis do recover but a general purulent meningitis does not terminate in recovery. Dr. Pierce did not believe that the papilloma of the larynx had anything to do with the fatal termination in the case of the child.

Dr. G. E. Shambaugh:—The various problems connected with inflammation of the meninges associated with diseases of the middle ear are attracting a great deal of interest at present. It has been established that many cases presenting evidences of meningitis which were formerly accepted as proof that the patient had a fatal malady, may recover if the proper operative procedures are carried out soon enough. It appears that cases of serous meningitis may terminate spontaneously in recovery. That cases suffering from a diffuse suppurative meningitis may also recover if the focus of the infection in the ear is removed and the proper drainage established seems also to be possible. Whether a case of purulent meningitis more or less circumscribed may not tend to recovery in certain cases where nature has provided drainage, is the question which this case of Dr. Holinger's throws light upon. This case is one of very great interest. as the pathological findings and the history seem to suggest that a case of circumscribed purulent meningitis may tend to spontaneous recovery. That the patient finally succumbed to a recurrent attack which resulted in general diffuse meningitis cannot be accepted as proof that the recovery from the previous attacks might not have been permanent had the patient not suffered from an acute exacerbation of the middle ear process.

Dr. A. Heym:—A meningitis may be latent then become acute again. This may have been what took place in Dr. Holinger's case.

Dr. J. Holinger in closing:—Professor Schwartz at the Congress in Buda Pest contended that when a case of meningitis recovered it was serous and not purulent. In the case here reported the pus was seen coming from the roof of the attic. It did not come from the antrum. The woman was well for seven months after the first attack, did her work and complained of no trouble. Of course she had the suppurative otitis to which the meningitis was secondary. She recovered from the first attack but that the second attack of meningitis was but a continuance of the first I do not believe. The changes in the pia produced by the first attack were very clearly marked.

JO DAVIESS COUNTY.

The Jo Daviess County Medical Society met in Stockton July 21, 1910. The members and their ladies met in the parlors of Dr. Stafford's residence where luncheon was served, and at 1 o'clock the society assembled on the lawn and the following responded to roll call: Drs. Kreider, I. C. Smith, Kaa, Stafford, Keller, Renwick, Hillard, D. G. Smith, Cottral, Boots, Guthrie, Melhop, Miller, with Dr. Lovewell of Chicago, and Dr. Brown of Sycamore.

The scientific program was then taken up, and Dr. Kaa read a paper on "The Relation Between Disease of the Mouth and the Systemic Diseases." Dr. Boots read a paper on "A Study of Hyperchlorhydria," with report of a case. Dr. Lovewell, of Chicago, read a paper on "Some of the Newer Ideas in the Physiology of Digestion in Health and Disease," and presented a specimen of a corset liver with gall-stones. All these papers brought out interesting discussions by the members present and a vote of the society requested that Dr. Lovewell's paper be printed in the ILLINOIS MEDICAL JOURNAL.

At 5 o'clock the society was invited to the dining room of the Great Western Hotel and all participated in a banquet. The ladies spent the afternoon in automobiling and seeing the sights of the vicinity. D. G. SMITH, Secretary.

MACOUPIN COUNTY.

The July quarterly meeting of the Macoupin County Medical Society was held in Carlinville, convening in the reading room of Masonic Hall at 11 a. m. After organizing an adjournment was taken for dinner and the afternoon session was held in the opera house. The following were present: Drs. W. J. Donahue, of Plainview; Riffey, Cowan and Mitchell, of Girard; T. W. Morgan, of Virden; Gross and King, of Gillespie; Theodore Renner, of Benld; J. P. Denby, J. S. Collins, C. J. C. Fischer, J. Palmer Matthews and Lucinda H. Corr, of Carlinville; J. B. Liston, of Shipman.

A paper was read by Dr. George T. Palmer, of Springfield, Ill. The meeting closed with an address by Dr. W. J. Donahue, of Plainview, president of the Association. The next meeting will be held in October.

OGLE COUNTY.

The regular quarterly meeting of the Ogle County Medical Society was held in the Circuit Court Room in the Court House, at Oregon, July 20, 1910, at 1:30 p. m. President J. M. Beveridge called the meeting to order. The secretary's report of previous meetings was read and approved. The following members of the society were present: Alrutz, Beard, Beveridge, Beigham, Hanes, Houston, Krebbs, Kretsinger, Maxwell, Parkhurst, and Rice. This being a popular address to the profession and public by Dr. J. W. Pettit, Ottawa, Ill., a large number of visitors were present. The following officers were duly elected for the ensuing year: President, Dr. Charles Maxwell, Polo; vice-president, Dr. S. D. Houston, Polo; secretary and treasurer, Dr. J. T. Kretsinger, Leaf River; delegate, Dr. J. M. Beveridge, Oregon; alternate, Dr. L. A. Beard, Polo; censor, Dr. W. W. Hanes, Mount Morris.

Dr. J. W. Pettit, of Ottawa, read an excellent and instructive paper on "The Tuberculosis Problem." Dr. Pettit suggested that the society select a committee of five to meet a state committee later in the season to form a society for the treatment and prevention of tuberculosis.

Dr. J. M. Beveridge was appointed to select such a committee. On motion of Dr. Beard, a vote of thanks was tendered Dr. Pettit, for his valuable paper. The society adjourned to meet in Polo, the third Wednesday in October, 1910.

DR. J. T. KRETSINGER, Secretary.

WAYNE COUNTY.

The Wayne County Medical Society met June 29, and was largely attended. The meeting was held to celebrate the eighty-first anniversary of the birth of Dr. W. M. Johnson of Johnsonville, the venerable president of the society. Dr. C. E. Johnson, son of the president, entertained the members on the lawn of his beautiful home. A paper by Dr. C. O. Truscott on "Disease Germs and Germ Diseases" was read and recommended for publication in the ILLINOIS MEDICAL JOURNAL. Dinner was served to the entire society and several ladies who accompanied the members. After dinner Dr. W. M. Johnson gave an interesting review of his professional career, covering a period of fifty-six years, he was then presented with a new silk hat of the variety and style he has always worn. After a delightful session the society adjourned to meet at Fairfield at the usual time.

J. P. WALTERS, Secretary.

DISEASE GERMS AND GERM DISEASES.

C. O. TRUSCOTT, M.D.

This interesting and important subject is entirely too great to be treated in one paper, hence I will treat of disease germs at this time, and consider their pathologic results more in detail in the future.

The importance of disease germs is due to the fact that certain ones have been shown to be the cause of certain diseases and probably future investigation will show that such is the case to a far greater extent than we are yet aware. In fact, I believe that it will eventually appear that disease is essentially due to germs, but the problem or pathologic causation is very complex and often obscure, and the matter of the resistance of the organism which is attached must be regarded, as well as the attacking force, the micro-organism.

The process of the successful invasion of the animal body by these living agents which multiply and then cause pathologic conditions, by forming toxic substances, is known as infection.

These agents are mainly micro-organisms, and comprise hyphomycetes, or molds, blastomycetes or sprouting fungi, and schizomycetes, cleft fungi, to which last class belong most of the microscopic pathogenic organisms.

These organisms consist of small vegetable cells, which have no chlorophyll nor nucleus and they are divided according to their shape, into cocci, bacilli and spirilli. Cocci are commonly of spherical shape, and are named according to the manner of the grouping of their cells. The diplococci are grouped in pairs, the tetracocci in fours, the sarcina in masses of eight or more, the streptococci in chains and the staphylococci either singly or in groups of many cells.

This individual grouping of the cocci is not always constant, but it may vary considerably especially under cultivation, and the usual manner of grouping is not as important as is the action of the individual micro-organism. Bacilli are rod-shoped bacteria, which vary in size and shape, some being immobile and others being mobile by reason of cilia or flagella.

The bacillus tuberculosis and anthracosis are well known examples of this class of bacteria. Spirilli are curved forms of bacteria, the best pathogenic example of which is the cholera vibrio or comma bacillus of Asiatic cholera.

Some of the most important bacteria which cause specific diseases are the following: Streptococcus erysipelatis, causing erysipelas; streptococcus pyogenes, causing acute abcess, infective endocarditis, septicemia, pyemia and carbuncles; diplococcus lanceolatus pneumoniæ, causing pneumonia; gonococcus, causing gonorrhea; diplococcus intracellularis meningitidis, causing cerebro-spinal meningitis; bacillus anthracosis, causing anthrax; bacillus tuberculosis, causing tuberculosis; bacillus lepræ, causing leprosy; bacillus diphtheriæ, causing diphtheria; bacillus typhosis, causing typhoid fever; bacillus influenzæ, causing influenza; bacillus pestis, causing bubonic plague; bacillus mallia, causing glanders; bacillus tetani, causing tetanus; bacillus edematus maligna, causing malignant edema; vibrio cholera Asiatica, causing Asiatic cholera; spirillum obermeieri, causing relapsing fever.

Then there are certain micro-organisms which are allied to the bacillus typhosus, for instance, the bacillus coli communis, which occurs normally in the intestine, yet in certain conditions becomes a pathogenic bacillus. Another instance is the bacillus enteritidis which has been found in some cases of meat poisoning, and the bacillus dysenteriæ, which is the cause of a form of dysentery.

There are various other pathogenic micro-organisms, but these just mentioned are the most important and best known. The growth and degree of vitality of bacteria in the body and especially in an artificial medium, depend upon the temperature, the amount of oxygen present, the presence or absence of sunlight and the nature of the nutrient medium.

The most of the pathogenic bacteria grow at a temperature of from 98° to 100°, the usual temperature of the body. The typhoid and colon bacilli will endure very low temperature, whereas the glanders bacilli lose their virulence at a temperature below 98°.

No bacillus will endure a temperature of 140° long in a liquid medium, but to kill spores requires 212° and a longer exposure. The amount of oxygen in the nutrient media of bacteria is a marked factor in their growth. Some of them grow in the presence of oxygen, and are termed aerobic, while others grow in the absence of oxygen, and are called anaerobic. The most of pathogenic bacteria are aerobic, yet they can grow without oxygen, hence they are called facultative anaerobic. Examples of this are the pus cocci, pneumococcus, bacillus anthracis, the bacillus typhosus, the bacillus coli communis, and the vibrio of Asiatic cholera.

The tetanus bacillus is an example of the other type. It grows in the absence of oxygen, hence is called an obligatory anaerobe. However these facts are not of great clinical importance as the presence or absence of oxygen in the body is not the principal factor in the control of bacterial growth.

Bacteria and even their spores, are destroyed by sunlight, either direct or diffused. For instance the tubercle bacillus is killed by an hour's exposure to direct sunlight, and in from five to seven days' exposure to diffused sunlight. The typhoid and the colon bacilli, the bacillus pyocyaneus, and the cholera vibrio are destroyed by from four to seven hours' direct sunlight, and anthrax spores are killed by from two to six hours' exposure to direct sunlight, or to an electric arc light. These statements apply to culture work, whereas the destruction of bacteria by sunlight when they are in the excretions, requires a much longer time. In regard to the nature of the nutrient media of the pathogenic bacteria, which can be cultivated, there are certain essentials. It must contain some proteid substances, must be slightly alkaline or neutral, and must contain a certain amount of mineral salts in practically the same proportion as they are found in the blood. These salts are the chlorids of sodium and potassium, and the phosphates of calcium and magnesium.

A living cell cannot exist without chlorid of sodium. It and calcium phosphates are a necessity for the vitality of protoplasm. Pathogenic bacteria are highly specialized micro-organisms, which have evolutionized from forms similar to the non-pathogenic bacteria by reason of their environment in disease. The most of them, which cause a definite disease, pass all their active life in the animal body and during the course of the diseases which they cause. Usually they do not live any length of time in the dead body, and some may even disappear before death occurs, as in some cases of tetanus and diphtheria, while on the other hand some of them have great vitality outside of the body, such as the pus cocci, and the anthrax, tetanus, typhoid and colon bacilli. The anthrax and tetanus bacilli produce spores outside of the body, but the bacteria of tuberculosis and glanders have a very short existence outside of the body, neither can they grow outside of the body, except in the proper culture media. Even the colon and typhoid bacilli will not live for any length of time in sewage water or soil.

There is a great variability in the virulence of the same forms of bacteria, which fact is of great clinical interest, as it gives us an insight into the different

degrees of severity of different cases of the same disease, because of the different intensity of the infective agents.

The virulence of bacteria is measured by their power of producing their characteristic chemical poisons, which they do to the best advantage in their natural habitat, the animal body. All forms of bacteria tend to degenerate sooner or later in culture. For instance, the pneumococcus and streptococcus lose their virulence in one or two days in artificial culture. The virulence of bacteria may be attenuated or increased, both artificially or naturally. Artificial culture causes attenuation, and even innocuousness.

Attenuated growth is caused by heat, or the use of certain antiseptics. Increased virulence is mainly caused by passing the bacteria through a series of animals in which manner twenty or thirty fold increase can be obtained and a fatal result will occur in sixteen or eighteen hours, apparently from a fatal dose of the chemical poison produced by the bacteria. Another method of increasing bacterial virulence is to combine the chemical poison of another bacterium with the bacterium in use, and the passing of the combination through a series of animals causes an astonishing degree of virulence. For instance, diphtheria toxin can be produced which is as deadly as the venom of the cobra. This variability of virulence also occurs in bacteria which have their habitat in the animal body, and this in a measure is one of the factors which governs the variety of disease. As previously stated, bacteria produce their pathologic results by means of the chemical poisons which they form, some of which are of a highly complex nature and are closely related to certain poisons produced by animal cells, such as snake venom, and by certain plants, as abrin from the seeds of the abrus precatorious or prayer bead, and ricin the toxic principle of the seeds of the castor oil plant. Our knowledge of the nature of these toxins is very imperfect, and we cannot chemically define them, but it is their more or less rapid formation, according to the activity and growth of bacteria, which causes the symptoms of infective disease.

These bacterial poisons are divided into two groups: one group which consists of the products of the digestion proteid tissues by the bacteria, and hence it is called the digestive group of bacterial poisons. In the other group, the poison is either intra-bacterial, or it is an excretion of the bacteria. This excretory group is more toxic than the digestive group, and both groups are usually associated. As regards the general action of bacterial poisons, there is no immediate effect, after infection, and for instance by injection, because there is an incubative period, after which occur the symptoms characteristic of the infective agent. These poisons may cause fever, or a great depression of temperature, blood destruction, tissue degenerations, and have a selective action upon the nervous system and heart. It is very characteristic of these toxins that they have a selective affinity for special organs.

The products of the digestive group of bacterial poisons are mainly albumoses, which are constantly found in the body after death from infective diseases, and they are excreted in the urine. These toxic albumoses seem to be an important factor in some diseases, as anthrax, diphtheria, and pus infections. The poisons of the bacterial excretion group, are essentially different, and far more powerful than those of the digestive group. The following table gives an idea of the comparative toxicity of poisons. The figures represent the parts in weight of a rabbit or guinea pig, which will be killed by one part of dried poison: cobra or tiger snake, 4,000,000; diphtheria toxin, 4,000,000; ricin, 1,500,000; viper, 80,000 to 2,000,000; adder, 250,000; anthrax and cholera albumoses, 3,000.

The study of infection, as found in human diseases, especially is very interesting and important, and in order to prove that bacteria are the cause the following facts must be determined: 1. The bacterium must be constantly found in the disease. 2. It must be obtained from the lesions of the disease, or from pure cultures of the blood and tissues. 3. It must reproduce the disease in susceptible animals. 4. It must be obtained from these animals in pure culture. 5. The chemical products, with an identical physiologic action, must be obtained from artificial cultures of the infective agent, and from the tissues of persons or

animals, who have died of the disease. 6. A specific serum reaction must be obtained with the infective agent.

In most of the infective diseases the first four facts are usually demonstrated, except that in some instances, as cholera and typhoid fever, there are no animals which are known to be susceptible to these diseases. The specific serum reaction, when it can be obtained is conclusive proof of the specific nature of the infective agent. The pus cocci are a good instance of proof of the first four propositions. They are constantly found in abscesses whence they can be obtained in pure culture which can reproduce abscesses or septicemia in animals, from which the cocci can be secured in pure culture. This experimental proof applies also to the pneumococci, the bacillus anthracis, the bacillus mallei, the bacillus pestis, and with the bacilli of diphtheria, tetanus, actinomycosis and their corresponding diseases. Diphtheria and tetanus furnish proof of the fifth proposition, previously stated, as there are chemical products found in fatal cases of diphtheria, which produce a paralysis due to nerve degeneration similar to that caused by the products of the diphtheria bacilli from culture media, and the products of the tetanus bacillus cause tetanic spasms, although ordinarily the tetanic poison cannot be found in the corpse, as the tetanic bacilli disappear before death. In the case of Asiatic cholera, the vibrio is constantly found in it, and when Emmerich and Pettenkofer swallowed vibrio cultures, diarrhea resulted, the stools containing the vibrio, and a worker with the vibrio at Hamburg contracted fatal cholera from a vibrio culture at a time when there was no cholera in Germany.

In some infective diseases the bacteria have not been cultivated, for instance leprosy, relapsing fever and malaria. In malaria, the proof of the plasmodium being the causative agent is as follows: It is constantly present in the red blood corpuscles during the acute disease. It develops in association with the symptoms of the disease, and with the recurrence of the attacks. It has been reproduced in a healthy man by mosquitoes, which have been artificially fed with the tertian parasite. I will treat some infective disease more in detail in some future papers.

In conclusion, I will say that this field of medical labor offers the greatest promise of advancement in the knowledge of the causes, nature and treatment of disease.

A CASE RECORD.

W. E. Walsh, M.D., Morris, Ill.

The patient is 18 years old and measures 4 feet 6 inches in his stocking soles instead of 5 feet 6 or 8 inches. You will notice that the skin is dry, slightly scaly and harsh. The hair is coarse. His face is moon shaped with excessive deposits of fat at the angle of the jaw. The whole body is fat with large pads on the back of the neck and pubes and the supraclavicular spaces are full. His pulse runs from 80 to 82, standing, and sometimes goes as low as 70.

These symptoms have persisted for six years that we know of and possibly before that, as his height is that of an average boy of 11 years. Together with these symptoms of myxedema we have an enlarged thyroid gland, especially large and soft on the right side, tremor, heart fast on exertion, and slightly dilated. The hair although coarse has lustre and strength, the face has good features and expression with strong mental capacity. The hands are tapered and small instead of being large and flabby. All that he complains of are slight headaches and dizziness and fast heart on continuous exertion. Practically all these symptoms have persisted for six years.

The patient was born in Grundy county on a farm. His parents are normal size, his mother being stout and his father thin. Four brothers and two sisters are all medium size and in good health. At the age of 5 he had a severe bronchial pneumonia, made a complete recovery and started to school at 6 and continued at school regularly until two years ago, always standing at the head of his classes in all the eight grades, his application being exceptional and his

ability above the average. At the age of 8 he had adenoids and tonsils removed. At the age of 12 it was noticed that the growth was arrested or slow and in the Fall of 1906, at the age of 14, the patient applied to me for headache and a large neck. Correction of refraction was ordered for the headache but with no benefit. On account of the mucous pads and the arrested growth 2.5 grains of Armour's thyroid tablets were given three times a day and continued at intervals for several months, stopping when the heart went over 100 and resuming it again after it had fallen to 80. In March, 1907, three weeks after discontinuing the thyroid, he became suddenly sick with headache, fever, nausea and prostration with tenderness and enlargement of the right thyroid. His blood pressure, which before had been between 120 and 130, now rose to 140 and his heart rate was 120-130. At this time the case was referred to Dr. Sippy of Chicago, who found a dilated heart, tremor and prostration, all indicative of hyper-thyroidism. The acute symptoms lasted for three weeks and then the former and present condition resumed itself.

During the last three years all forms of medication have been used in an endeavor to increase his growth. He has been under the care of three Chicago consultants and two others, one in Joliet and one at Springfield. Ergot, iodonucleoid, malt and linseed oil and some thyroid have been given but he has only grown one-half inch in the last four years.

The case evidently presents features of hypo-thyroidism with symptoms of hyper-thyroidism and these conditions have persisted for six years, which is rather contrary to the present generally accepted theory of the functions of the thyroid gland.

NEWS OF THE STATE

PERSONAL.

Dr. S. M. Parr has removed from Fountain Green to Carthage.

Dr. G. W. Fuller, of Paris, has removed to Missoula, Montana.

Dr. Chas. True, Kankakee, is in a serious condition from a stroke of paralysis.

Dr. Elbert E. Clark, Danville, sailed August 6, to attend clinics in Germany.

Dr. Wm. J. Cheany, Petersburg, has been appointed county poor physician.

Dr. J. Scott Brown, has removed from 284 Lake Street, River Forest, to Burnett, Wis.

Dr. B. C. Corbus, Chicago, has gone to Berlin to investigate the new Ehrlich treatment.

Dr. Francis E. Melugin, Thomson, recently underwent an operation at the Clinton Hospital.

Dr. Clinton Helm, a practitioner of Rockford for thirty years, was recently stricken with paralysis.

Dr. and Mrs. I. A. Abt, of Chicago, sailed August 20, for Europe. They expect to return in November of this year.

Dr. V. H. Podstata has taken an office at 100 State Street, Chicago, and will limit his practice to nervous and mental diseases.

Dr. Henry R. Harrower, editor of the *American Journal of Physiologic Therapeutics*, has removed from Kankakee to Park Ridge.

Dr. George Sultan has become a candidate for county commissioner of Cook County. His candidacy is endorsed by many leading physicians.

Dr. Will H. Perry has been appointed pension examining surgeon at Sterling to fill the vacancy caused by the death of Dr. Alexander C. Smith.

Dr. A. Fields, Stonington, Christian County, has gone to London and Paris for post-graduate work. Dr. W. T. Seeley, of Chicago, will have charge of his practice.

Dr. William M. Johnson, Johnsonville, nestor of the medical profession of Wayne County, has been elected president of the county medical society. Dr. Johnson is 81 years old.

Dr. H. T. Hardy, long called the "Dr. MacClure, of Kaneville," with reference to the famous doctor in "Beside the Bonnie Brier Bush," underwent a surgical operation for gall-stone at Wesley Hospital, Chicago.

Among the Chicago members of the American Society of Clinical Surgery who recently visited England as the guests of the English surgeons,

Drs. A. D. Bevan, Frank Billings, M. L. Harris, and L. L. McArthur have returned.

Dr. Milton J. Rosenau, professor of pathology in Harvard University Medical School, is to deliver the Harris Lectures for 1912 at Northwestern University. These lectures were established by the gift of Mr. Norman W. Harris.

NEWS ITEM.

—Dr. M. M. Hill, of Taylorville, has removed to Winfield, Kansas.

—It is reported that Dr. L. D. Howe, Cherry, will locate in Streator.

—Henry P. Bagley, M.D., has taken an office at 103 State Street, Chicago.

—Dr. J. E. Tuite, Rockford, fractured his right arm at the wrist while cranking his automobile.

—The cornerstone of the new Monmouth Hospital was laid August 2. J. B. Brown delivered the address.

—The new hospital for consumptives at the State Hospital for the Insane, at Bartonville, is nearing completion.

—The new Monmouth Hospital at Monmouth is now under construction. Dr. Edward L. Mitchell is a member of the building committee.

—As a first step toward the establishment of a much needed hospital at Sterling, the city council recently appropriated $500 to be used for hospital purposes.

—The great need of a public hospital in Sterling has been brought to the attention of the city council and the institution all ready in the city will probably be taken over by the city government.

—Dr. Stephen W. Cox, of 100 State Street, Chicago, has been appointed United States examining surgeon on the first pension board of Chicago, to take the place of the late Dr. John W. Tope, of Oak Park.

—Dr. Archibald G. Servoss has resumed the practice of medicine at Havana, after an absence of several months. He has been located in North Dakota, in which state he purchased a 320 acre farm a year ago.

—Plans for the new $50,000 Methodist Hospital at Peoria have been completed and bids asked for. The plans provide for a four story building in the renaissance style, 70 by 80 feet. The kitchen will be placed on the top floor.

—Some time ago the Illinois State Board of Health declared the National Medical University, one of the Chicago "night" medical schools, not in good standing. The dean of this school now charges that he paid a fee to a Chicago lawyer-legislator for the apparent purpose of influencing the State Board to reinstate the school. This dean further charges that five or six other medical colleges in Chicago are paying money to keep in the good graces of the State Board of Health. All of the charges are denied, both generally and specifically, by the board and the governor and state's attorney have each started investigations of the whole matter.

PUBLIC HEALTH.

—Dr. Leslie L. Lumsden, who is conducting the campaign against typhoid fever in Chicago, requests a meeting of physicians to discuss the situation. The medical societies of the city have no regular meetings during the summer and it is desired that special meetings be called.

—Dr. Augustus R. Reader, health officer of Aurora, has issued to householders and property owners of the city a set of eleven rules in regard to personal hygiene and public sanitation which have attracted attention throughout the country. Rule eight requests all persons to bathe at least once a week.

—Evanston claims to be the healthiest city in the state, the death rate for the past year being reported as only nine per 1,000 of population.

—Since the abandonment of the old Harrison Street Emergency Hospital, Chicago, two rooms have been fitted up in the Harrison Street Police Station for emergency hospital purposes, in charge of Drs. Charles D. and Clarence H. Wall. As many as ten to fifteen minor surgical cases have been cared for each day.

—At Rockford, Corporation Counsel Rew has rendered an opinion that inspection of public school children should be done under the supervision of the city health department instead of the school board and that the board of education cannot legally provide for medical inspection. It is said that State Attorney-General Stead and State Superintendent Blair hold the same opinion.

—A laborer in a railroad camp at Williamsfield is said to have been quarantined for smallpox in Galesburg for twenty-seven days. Upon being released as cured he spent some time in Monmouth. Not feeling well, he went to Rock Island, where the county physician diagnosed his case as smallpox, and sent him to the pest house. Was this a relapse or did the Galesburg authorities release him before he was well?

—The question of cooperation of the government in enforcing the law which prohibits dumping refuse in the lake within the eight-mile limit, recently referred to the chief engineer of the United States Army, has been answered in a communication from General Bixby, chief engineer, in which he says that the city of Chicago must mark the zone within which dumping is illegal by buoys and must provide inspectors to see that the law is enforced, as no money has been appropriated by Congress to enable the War Department to assist in the matter.

—The Chicago Tuberculosis Institute is endeavoring to raise a midsummer fund of $2,500 with which to support the work until fall. The eight free tuberculosis dispensaries are handling from twenty to sixty patients a day. Every month about 240 new cases are examined and the eleven nurses are making nearly 1,700 visits a month in homes of the patients. In addition three of the nurses devote a portion of their time to three open air schools for anemic children, maintained at the Libby School, Penn School and Lake View High School. There are 35 children in each school.

—According to the Bulletin of the Chicago Health Department, July had a 6 per cent. higher death rate than the average of that month for the last ten years, and 23 per cent. higher than July, 1909. The weather during July averaged 3.6 degrees above the normal of the month. It was the hottest July in nine years, and the average temperature was exceeded only once in thirty-nine years. While the death rate in infants was 42 during July this year, it was lower than the death rate in 1897, when it was 71 per 10,000 population, and lower than 1901, when the death rate was 44, making the rate 45 per cent. lower than in 1897 and 5 per cent. lower than in 1901, in both of which years the temperature, though high, was not so high as in July this year.

—John J. Davis, assistant state entomologist, in his experiments in the destruction of flies and fly larvæ, has found that a solution of iron sulphate is probably the best and cheapest agent. He advocates that experiments with this material in preventing the multiplication of flies should be conducted by the health authorities of Chicago in certain limited districts, and believes that a noticeable effect will be produced on the prevalence of intestinal diseases in the experimental area. In an experiment at Dunning a year ago, Dr. Pollock kept one ward screened from flies during the season. In that ward there was one case of intestinal trouble which lasted three days. In the next ward, which was not screened, there were seven cases in the same length of time and every one of these cases lasted from three to seven weeks. A fly hatchery has been added to the city laboratory and Dr. John W. Viers is conducting experiments in the destruction of fly larvæ. Flies are being hatched in wire cages. It has been found that a phenol solution sprinkled on hatching grounds, on garbage and on manure will kill them.

—At the meeting of the Summer School at Havana, July 26, Dean E. J. Townsend, of the University of Illinois, in an address on "Science and Public Service," suggested a plan for the establishment of an experiment station of sanitary science and preventive medicine, to work alongside of the agriculture and engineering experiment stations of Illinois. He declared also that education of the public to the sources of danger is equally important. He called attention to Chicago as a good illustration of what a scientific and efficient leadership in sanitation can accomplish, pointing out that Chicago has now the lowest death rate of any American city of more than 350,000. His plan for an experiment station included the following features: That it should supplement the work done by the state and municipal boards; that a laboratory of physiologic chemistry should be maintained, in which questions of human nutrition could be studied; for the conduct of a bacteriologic laboratory; for the creation of a laboratory of sanitary science in which problems arising from water supplies, sewage disposal, etc., and their relations to public health should be investigated; for the establishment of a department of medical research, not for teaching, but for inquiry into the cause and prevention as well as cure of such diseases as have not yielded to medical treatment.

MARRIAGES.

WALLACE BLANCHARD, M.D., to Miss Gahfea Brandt, both of Chicago, July 12.

JAMES CLINTON RUSSELL, M.D., to Mrs. Ella Thomas, both of Oakford, July 4.

CARL S. MONTGOMERY, M.D., Stockland, to Miss Leona B. Garrett, of Momence, June 30.

HUGH O. JONES, M.D., Chicago, to Miss Nettie Perry, of Oshkosh, Wisconsin, July 27.

DR. DANIEL E. RICARDO, of Chicago, to Miss Justine Theresa Friend, of Cincinnati, Ohio.

HARRY D. CARTMELL, M.D., to Miss Oradella DeMoulin, both of Greenville, August 11.

C. HUGH MCKENNA, M.D., to Miss Evelina Margurite Beauvis, both of Chicago, August 19.

LEWIS W. DUDLEY, M.D., Elgin, to Miss Marion T. Connell, at Fond du Lac, Wis., June 29.

FRANK BLAIR LOVELL, M.D., Gibson City, to Miss Helen Lewis Brewster, of Wheaton, June 30.

LOUIS GRAYSON HARNEY, M.D., East St. Louis, to Miss Lela Elinor Workman, of St. Louis, June 4.

OTTO DARWIN DIEHL, M.D., Centralia, to Miss Marjorie Nies, of Virginia, Minn., at Chicago, July 16.

MIAL R. LYMAN, M.D. Bad Axe, Michigan, to Miss Elizabeth E. Deno, of Saginaw, at Cuba, Ill., June 30.

DEATHS.

CHARLES H. DYER, M.D., Eclectic Medical Institute, Cincinnati, 1896; died at Winchester, Ill., July 13, from heart disease, aged 37.

C. H. DYER, M.D., Eclectic Medical College, Cincinnati, 1896; died at his home in Winchester, July 13, 1910, aged 36 years, 4 months and 29 days.

JACOB RANDALL (license, 1878, Ill.); said to have been the oldest physician in Washington County, Illinois; died at Okawville, Ill., June 8, aged 85.

JONATHAN TULLIS HALL, M.D., Indiana Medical College, Indianapolis, 1876; died at his home in Sidell, Ill., July 10, from meningitis, aged 58.

JAMES HENRY, M.D., Bellevue Hospital Medical College, New York City, 1870; a veteran of the Civil War; formerly of LaHarpe, died at his home in Galesburg, August 2, from paralysis, aged 69.

ALEXANDER L. MURPHY, M.D., Jenner Medical College, 1909; of Chicago; was killed by a Pere Marquette train at Benton Harbor, Michigan, July 23, while on his way to Bangor, Michigan; aged 36.

NATHANIEL SEWARD PARSONS, M.D., University of Vermont, College of Medicine, 1874; a member of the Illinois State Medical Society; died at his home in Kewanee, August 8, from Bright's disease, aged 59.

LESTER M. CURRIER, M.D., Hahnemann Medical College, Chicago, 1873; a member of the Illinois State Medical Society; died at his office in Freeport, Ill., July 6, from gall-stones, aged 63.

HOMER C. SHAW, M.D., Starling Medical College, Columbus, Ohio, 1852; army surgeon during the Civil War, belonging to the Tenth Ohio Volunteer Infantry; died at his home in Homer, Ill., July 23, from paralysis, aged 82.

CHARLES N. DENISON, M.D., Cincinnati College of Medicine and Surgery, 1861; surgeon of the Eighth Illinois Volunteer Infantry during the Civil War; died at his home in Argenta, July 25, from papilloma of the bladder, aged 74.

IRA BROWN, M.D., University of Michigan, Department of Medicine and Surgery, 1858; Vanderbilt University, Medical Department, Nashville, 1876; a member of the Illinois State Medical Society; a veteran of the Civil War; a member of the Board of Pension Examining Surgeons at Watseka; died at his home in Milford, July 24, from heart disease, aged 78.

DR. C. M. DENNISON died at his home, in Argenta, July 25, 1910, aged 74 years. Dr. Dennison was a native of Connecticut; he graduated from the Cincinnati College of Medicine and Surgery in 1861, and came immediately to Illinois. He served as assistant surgeon in the Eighth Infantry during the Civil War, and had resided at Argenta for thirty-seven years. The Doctor had accumulated a fortune rated at more than $200,000.